Easthampton New City Neighborhood Infrastructure Master Plan

Appendices

June 2022

Prepared by:

FUSS & O'NEILL

1550 Main Street, Suite #400
Springfield, MA, CT 01103

Project No. 20170289.D10

Appendices

Appendix A

"Walkshop" Feedback and Safety Actions Follow-up Memo

FUSS & O'NEILL

MEMORANDUM

TO: Jamie Webb, Assistant City Planner, City of Easthampton

FROM: Julianne Busa, PhD, Fuss & O'Neill

DATE: November 24, 2021

RE: New City Neighborhood Infrastructure Master Planning Project
"Walkshop" Feedback and Safety Actions Follow-Up

On Saturday, November 20th, Fuss & O'Neill and the City of Easthampton hosted a neighborhood "Walkshop" event in the New City neighborhood to gather input from residents regarding infrastructure concerns and desires for future improvements and/or neighborhood facilities. Approximately 42 residents attended the event. Input from residents was collected via markups and comments on several maps of the project area, as well as during small group walking tours led by teams consisting of Fuss & O'Neill and City staff. The information collected from residents is being incorporated along with infrastructure inspections that are being conducted by Fuss & O'Neill to evaluate the condition of pavement/sidewalks/curbing and ADA compliance, sewer and water systems, street tree health and canopy cover, and drainage issues. Ultimately, this project will result in a master planning document to be presented to residents and City officials in the spring/early summer of 2022.

Several issues were raised by residents during the walkshop that point to more immediate concerns around safety and connectivity for residents moving through the neighborhood, either by vehicle, or as pedestrians. The following is a list of recommended 'immediate' actions which the City may want to consider as follow-up to the walkshop event. Note that these recommendations are a reflection of resident opinion and their reported observations; they are not based on a detailed traffic or safety study by Fuss & O'Neill. Those actions that do deal with traffic issues are intended to reinforce and/or clarify existing traffic rules; none of the recommendations entails a change to existing traffic patterns or regulations. Likewise, this list of recommended actions should not be considered an exhaustive list of safety concerns or recommended improvements for safety.

This list of recommended actions is intended to capture actions that may be able to reasonably be performed without significant expense or effort on the part of the City and which would send a meaningful signal to residents of New City who took part in the walkshop to communicate that 1) their concerns were heard and 2) the City is serious in its intent to utilize resident input from this planning process to inform the direction for future projects in New City.

1) Repair broken street lights.
    - Insufficient lighting was a major theme to emerge from the walkshop. While this will be addressed more fully in the master planning document, residents reported that several existing street lights (particularly on Maine Ave.) are not functioning. Repairing these lights would provide some immediate improvement.

2) Install additional stop signs at implied stops.
    - The two locations shown in the map at right where side streets intersect with Emerald Place were both called out as particularly problematic areas where motorists commonly ignore the implied stop at a t-intersection.

3) Utilize the City's existing portable speed monitoring signs on Parsons Street and Lincoln Street to reinforce existing speed limits, as has been done elsewhere in the City.
    - These two streets were reported to be significant concerns where speeding causes unsafe conditions for pedestrians, bicycles, and other vehicles.

4) Stripe the first 15 feet of the north side of Federal Street as shown at right to reinforce the implied no parking rule and improve turning room and sightlines at the intersection with Parsons Street.
    - It was reported that cars are often parked within 15 feet of the intersection, in violation of existing parking regulations.

5) Install pedestrian crossing signs at the existing crosswalk across Ferry Street adjacent to the intersection of Emerald Place and Ferry Street to improve visibility of the crosswalk and facilitate easier crossing.
    - Residents indicated that this crosswalk is a significant safety concern for those who are trying to access the bike path connection from the New City neighborhood.

Appendix B

Inspection of Project Area Memo

FUSS & O'NEILL

MEMORANDUM

TO: Jamie Webb, Assistant Planner, City of Easthampton

FROM: Julianne Busa, PhD, Fuss & O'Neill
J. Alexander Maxwell, PhD, Resilience Planner, Fuss & O'Neill

DATE: February 28, 2022

RE: Task 2 – Inspection of Project Area

In support of Easthampton's *New City Neighborhood Infrastructure Planning Projects (NCNIPP)*, Fuss & O'Neill has conducted visual inspections of the infrastructure in the New City Neighborhood to assess existing conditions. These assessments included visual inspections of sidewalks, crosswalks, ramps, curbing, drainage structures, water systems hydrants, manholes, pavement surfaces, and street trees throughout the neighborhood. This memo summarizes the key findings from these visual inspections.

Pavement, Curbing, Sidewalk, Crosswalk and Ramp Inspections

Inspections of pavement, curbing, sidewalk, crosswalk, and ramp conditions were conducted by Fuss & O'Neill staff throughout the New City Neighborhood using ArcGIS Survey123 field inspection forms to efficiently collect and georeference inspection data. The following bullets summarize key findings from the inspections:

- The interior streets (e.g., Oakdale Place and Clinton Street) had the worst conditions.
- The outer streets (e.g., Ferry Street and Everett Street) were generally in better condition, with Parsons Street having the worst conditions among the outer streets.
- Most ramps throughout the neighborhood were not compliant with the Americans with Disabilities Act (ADA) standards for accessible design.
- Sidewalk conditions along Emerald Place – a highly-used street by pedestrians – were deemed of the highest priority to address issues with missing sections/gaps in the sidewalk. A section of sidewalk was also missing linking Lincoln Street/Broderick Street with Everett Street.

Drainage Structures, Outfalls, Swales, and Problem Areas Inspections

Inspections of the drainage structures, outfalls, swales, and problem drainage areas were conducted by Fuss & O'Neill staff throughout the New City Neighborhood. These inspections were used to identify areas with erosion and sedimentation, broken pavement caused by stormwater flows or icing conditions, catch basin and manhole conditions, the effectiveness of drainage structures, and impacts of stormwater flow on private properties. The following bullets summarize key findings from the inspections:

- The highest priority drainage issues were identified at Emerald Place and near Oakdale Place and Glen Cove Place. Along Emerald Place, there were several areas with a lack of curbing to direct stormwater and evidence of sedimentation, ponding, slope failure, erosion, and runoff impacting private property. On Oakdale Place and Glen Cove Place, there were signs of erosion, sedimentation, high stormwater runoff velocities, broken/degraded due to runoff, and unpaved surfaces contributing to runoff.
- Ponding and sedimentation issues were scattered through the neighborhood, largely caused by poor pavement conditions, lack of catch basins or drainage management (e.g., along Harrison

Avenue), gravel driveways and parking areas (e.g., along Broderick Street), and a lack of curbing (e.g., along Glen Cove Place and Emerald Place).
- Outer roads, including Everett Street, Ferry Street, and Parsons Street, were less of a concern.

Sewer Systems Inspections

Topside manhole inspections were conducted Fuss & O'Neill staff throughout the New City Neighborhood. These inspections were used to note the structural condition, depth to existing piping, orientation of piping, pipe material, pipe sizes, estimated infiltration, and the condition of covers. The following bullets summarize key findings from the inspections:

- The highest priority for sewer system improvements is Parsons Street, where blockages are present and the sewer system is undersized. Additional CCTV video inspections conducted during Task 6 (Sanitary Sewer System Evaluation) of the project revealed that there were areas in the neighborhood (between Oakdale Place and Dartmouth Street and between Harrison Avenue and Emerald Place) where sewer lines cut through the backyards of private parcels. Relocation of these lines would require significant cost and coordination with homeowners.
- Additional smoke testing during Task 6 (Sanitary Sewer System Evaluation) of the project also revealed that there was one storm drain connection in the neighborhood at 14-16 Maine Avenue– potentially related to a recent home renovation.
- Aside from these areas, sewer system conditions across the neighborhood were in similar condition, and it was deemed that other non-sewer system-related factors could define the priority of infrastructure improvements.

Water System Hydrant Inspections

Inspection of each water system hydrant, including the model number and year installed, location of valves, and general conditions were conducted by Fuss & O'Neill staff throughout the New City Neighborhood. The following bullets summarize key findings from the inspections:

- Water mains throughout the neighborhood consist of 6-inch asbestos cement mains. This material tends to be brittle if exposed (i.e., if uncovered to complete other utility replacements or roadwork); the mains should therefore be replaced as other work is being completed. However, there were no obvious problem areas suspected in the mains themselves that are expected to be problematic if left undisturbed/prior to disturbance for replacement that suggest the need to prioritize one area over another. Hazardous waste disposal costs should be factored into the future disposal of existing piping.
- Water pressure throughout the neighborhood was excellent (around 100 psi), with little differences between static and drawdown pressures. Scattered pressure issues were reported by local residents and were deemed likely to be caused by problems within homes.
- The neighborhood lacks shut-off valves to enable isolation of sections of the water system for repair/maintenance. Isolation valves will need to be installed in several locations to facilitate phased infrastructure replacements.
- Of all the hydrants in the neighborhood, Chapman hydrants were the highest priority for replacement due to their age and condition. Chapman hydrants were located along Exeter Street and Dartmouth Street. Water infrastructure replacements should be prioritized in these areas.

Street Tree Inspections and Recommendations
Fuss & O'Neill partnered with David Hawkins of Urban Forestry Solutions, Inc. to complete the identification, inspection, and mapping of each street tree within the City right-of-way throughout the New City Neighborhood. Inspections also included trees on private property that may directly impact and/or be impacted by future work in the right-of-way.

A total of 12 street trees were identified throughout the neighborhood, 9 were large trees located along Emerald Place, 1 was located at the eastern end of Exeter Street, 1 was located along Parson Street south of Federal Street, and 1 was located at the intersection of Harrison Ave and Emerald Street. 9 trees were in good condition, 2 in fair-to-good condition, and 1 in fair-to-poor condition. Maintenance recommendations consisted of pruning for deadwood and/or crown weight reduction and support cable installation (on 1 tree).

31 additional trees were tallied at the 10 Lincoln Street parcel in the woodlands south and west of the parcel's circular drive and along the north boundary abutting the Federal Street properties. 19 of the trees were in good condition, 4 in fair-to-good, 2 in fair condition, and 1 was dead. It was recommended that 4 of the trees needed pruning, 3 should be removed, and 1 needed to be monitored for poor health.

Overall, canopy cover within the neighborhood interior was sparse and primarily consisted of private trees in back or side yards and the wooded area of the 10 Lincoln Street parcel. The only other canopy cover was along the west side of Emerald Place where canopy cover was high and consisted of mostly large maple and ash trees bordering the road and woodland area to the west.

While the New City Neighborhood is densely populated – with little-to-no room for additional tree plantings in the interior of the neighborhood near or in the public right-of-way – potential planting locations were identified along Emerald Place and in the northwest corner where there are large open lawn areas.

Planting trees on the Emerald Place properties will have little effect on overall canopy cover if the larger trees across the street remain. Careful consideration should be given as to whether the residents here want more trees given the number and size of the trees opposite the homes and the shade and litter generated. If canopy cover remains important to residents from this area of the neighborhood, then the existing, larger trees should be maintained to ensure their health, structural integrity, and safety to the residents.

Additional information
Additional project area inspection materials (e.g., complete street trees inventory report and detailed sewer and water system reports) will be provided to the Town in separate file transfers and summary memorandums. Summary map layers will also be provided along with the series of thematic maps development as part of Task 7 (Preparation of the Master Plan) of the project to visually represent existing conditions and key problem/focus areas.

Appendix C

Street Tree Inventory

Arboriculture Services
154 Buffam Road □ Pelham, Massachusetts 01002

Julianne Busa, Senior Environmental Scientist
Fuss and O'Neill
1550 Main Street, Suite 400
Springfield, MA 01103

December 9, 2021

RE: Tree Inventory, Health and Assessment of Trees New City Neighborhood, Easthampton, Mass.

Dear Ms. Busa,

Per your request, I submit the following tree inventory and assessment report for the New City Neighborhood Infrastructure Project. As you recall, we met at this neighborhood November 23, 2021, at which time we reviewed the project, discussed the scope of the tree inventory, and identified the locations within the neighborhood where the trees would be inventoried. These consist of all trees within the public right of way, trees in the wooded area of the Lincoln Parcel and Parson's Street Park.

The following report contains an inventory summary, a site plan of the neighborhood streets and the Lincoln Parcel – both with tree locations marked and numbered. The tree numbers correspond with inventory data in table format and includes each tree's information, location, condition, risk rating and maintenance recommendations. A separate data table contains the location and number of potential planting spots throughout the neighborhood.

Thank you for the opportunity to assist Fuss and O'Neill with this project. Please do not hesitate to contact me if you have any questions or need additional services.

Best regards,

David Hawkins, Consulting Arborist
Urban Forestry Solutions, Inc.

David C. Hawkins – Consulting Arborist
Office/Fax: 413-253-4266 Mobile: 413-237-5106
Email: dhawkufs@comcast.net Web: www.ufstrees.com

Contents

Inventory Summary

A total of 12 trees were identified within or next to streets in the neighborhood's public right of way and 31 trees were tallied in the Lincoln Parcel woodland. Of the 12 street side trees, 9 are large trees along the west edge of Emerald Place. The remaining three consist of one at Exeter and Parson's Street, one in Parson's Park and one tree opposite 63 Emerald Place. The 31 trees in the Lincoln Parcel are in the woodlands south and west of the parcel's circle drive and along the north boundary abutting Federal Street properties.

Of the 12 streetside trees, 9 are in good condition, two in fair to good and one fair to poor. One tree has a moderate risk rating[1] and should be removed. Six trees have a low-risk rating and five have no noticeable defects or conditions associated with risk (denoted as NA in data table). Maintenance recommendations consist of pruning for deadwood and/or crown weight reduction and support cable installation (one tree).

In the Lincoln Parcel, 19 trees are in good condition, four in fair to good, two in fair condition and one is dead. Four trees have a moderate risk rating and four have a low-risk rating. The remaining trees have no risk rating. Three of the 31 trees should be removed, one needs to be monitored for poor health and four trees need to be pruned.

The following three Site Illustrations[2] show the neighborhood streets with right of way trees marked and numbered (Site Illustration 1 - Page 5), the Lincoln Parcel (Site Illustration 2) and potential planting space in or near the right of way (Site Illustration 3).

The neighborhood street tree inventory begins at 46-48 Emerald Place and moves north and clockwise through the neighborhood ending at the south portion of Emerald place. The Lincoln Parcel inventory begins at the south woodland and moves north and clockwise ending at the northeast corner of the parcel. All streetside planting spaces are in the west portion of the neighborhood and consists of single spaces in front of houses and groupings of spaces in open lawn areas in the northwest section of the neighborhood.

[1] The risk ratings were assigned in accordance with the ANSI A300 (Part 9) – 2017 Tree Risk Assessment a. Tree Failure, and the International Society of Arboriculture Tree Risk Analysis - Best Management Practices

[2] Site Illustrations are not to scale. The marked trees and planting spaces are approximate and located from aerial images.

Tree Planting Discussion

The New City Neighborhood is a densely populated, residential area with primarily multifamily housing units. There is little or no planting spaces within the neighborhood's interior near or in the public right-of-way. There are potential planting spaces in the neighborhood's west side along Emerald Place, and in the northwest corner where there are large open lawn areas.

Canopy cover within the neighborhood interior is sparse and primarily consists of private trees in back/side yards and the wooded area in the Lincoln parcel. The only other canopy cover is along the west side of Emerald Place where large maple and ash trees border the road and woodland to the west. Canopy cover here is high. There are also at least 10 planting spaces in this area. However, all are in the front yards divided by a sidewalk with each section about 400 to 500 square feet. Overhead utility lines are over 2 of the planting spots. The size of the planting area, proximity to the houses and road, and presence of utility wires limits the new tree choices here to small and medium size trees at maturity.

Planting trees on the Emerald Place properties will have little effect on canopy cover if the larger trees across the street remain. Another consideration is whether the residents here want more trees given the number and size of the trees opposite the homes and the shade and litter generated. If canopy cover is important to this section of the neighborhood, then the existing, larger trees should be maintained to ensure their health, structural integrity, and safety to the residents.

The only other place where a tree canopy can be established is in the northwest section in the vicinity of Oakdale, Glen Cove Place, Lincoln Street and Emerald Place. This area consists of several areas of open lawn with space for about 20 to 30 trees. There are no overhead wires and room to plant moderately sized trees within the right-of-way and larger size trees (at maturity) if set back into the lawn areas.

Tree planting choices should consider insect and disease susceptibility – especially invasive pests, environmental factors – both macro (warming temperatures, drought, excessive moisture and temperature extremes) and microenvironments (exposure to the elements, wind patterns, soil quality and available sunlight). Tree height, form and root

space also need to be considered while taking into account the planting location and nearby infrastructure.

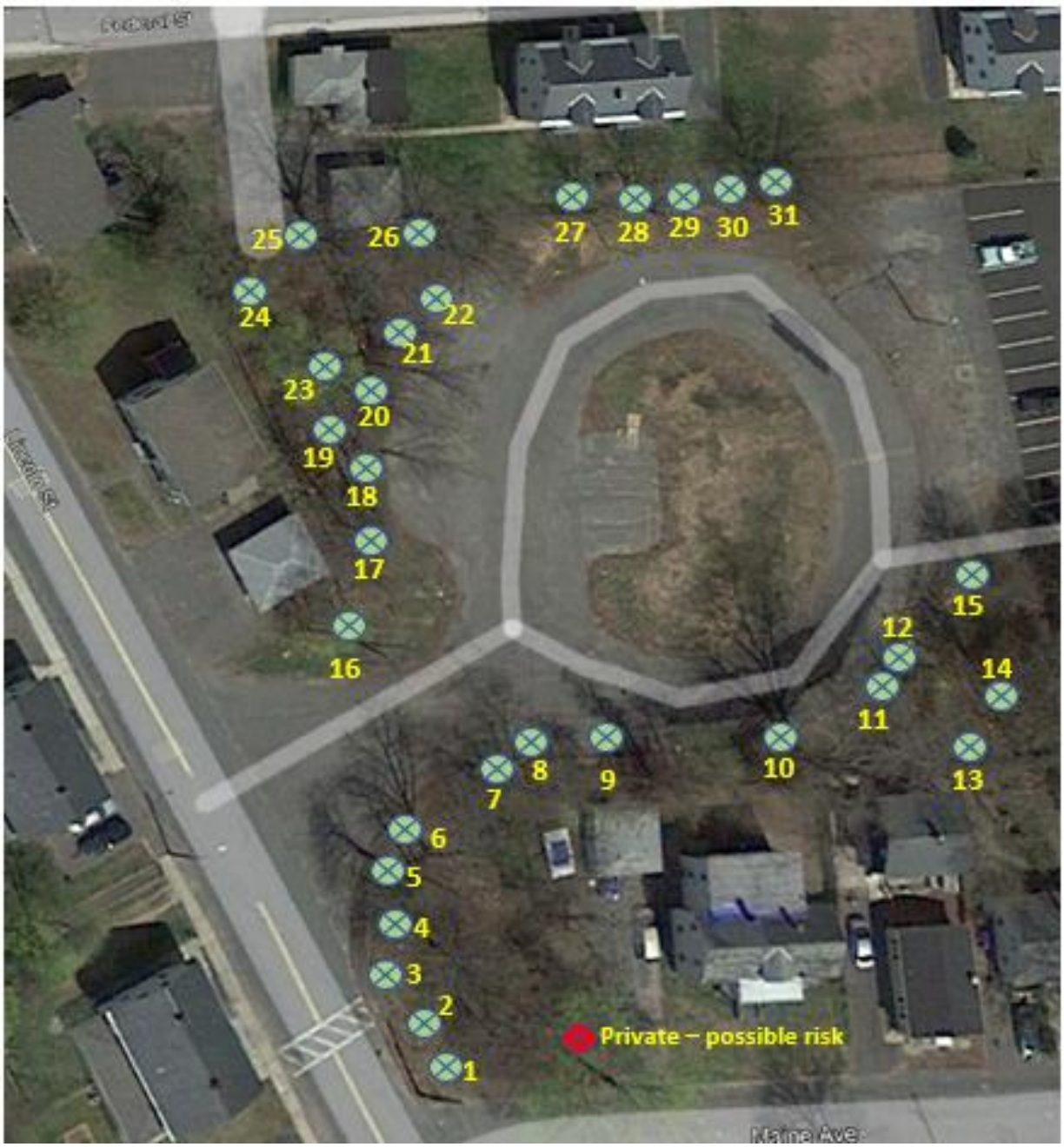
The table below lists some choices for new tree plantings. Tree selection considered native status, adaptability, drought tolerance and size and form at maturity.

Recommend Tree Species

Common Name	Scientific Name	Size at Maturity	Comments
Eastern Redbud	*Cercis canadensis*	Small	Good for under wires. Should be somewhat protected from wind
European Hornbeam	*Carpinus betulus*	Small	Columnar in form. Fast growing
Kousa Dogwood	*Cornus kousa*	Small	Upright form. Tolerant of harsh conditions. Late flowering
Crabapple	*Malus spp*	Small	Over 300 varieties to choose from. Good for under wires and tight spaces.
Thornless Hawthorn	*Crataegus crus-galli 'inermus'*	Small	Wide crown. 'inernus' cultivar resistance to leaf blights
Kwansan Cherry	*Prunus serrulata 'Kwansan'*	Small	Upright form. Tolerant but needs to be pruned early for form
Hedge Maple	*Acer campestre*	Small	Tolerant, vigorous tree. Maybe too tall for under wires
Red Maple	*Acer rubrum*	Medium	Many cultivars to choose from. Tolerant. Widely planted
Littleleaf Linden	*Tilia cordata*	Medium	Vigorous and tolerant. Needs adequate root space.
Hackberry	*Celtis occidentalis*	Medium	Good for lawn areas
Common Persimmon	*Diospyros virginiana*	Medium	Adaptable. Wide form
Ginko	*Ginkgo biloba*	Large	Adaptable, upright form. Unique tree
White Oak	*Quercus alba*	Large	Plant in open lawn area
Kentucky Coffee Tree	*Gymnocladus dioicus*	Large	Adaptable, wide crown. Has a fruitless variety (Stately Manor)
Honey Locust	*Gleditsia triacanthos*	Large	High, wide crown. Good shade tree. Adaptable and fast growing
London Planetree	*Platanus acerifolia*	Large	High, wide crown. Good shade tree. Adaptable and fast growing

Site Illustration 1 – Streetside Trees

Site Illustration 2 – Lincoln Parcel



Google Earth April 2016 Aerial Image.

Note: the red circle denotes a tree in front of 35 Maine Avenue outside the public right of way This is a 28" DBH Norway maple with a weak branch union and decay in the lower trunk. It has a moderate risk rating and a threat to the road and utility lines. Recommend removing the leader over the road.

Site Illustration 3 – Potential Planting Spaces

The above map is an enlarged copy of the west portion of the streetside tree map. All potential planting spaces are within this area except for Parson's Street Park. The yellow circles represent potential planting spaces within or close to the public right of way.

Note: the groups of circles in the north end represent multiple plantings. The recommended number and size are in the Planting Space data sheet on Page 11

Inventory Data

Street Side Trees

No.	Species	DBH	Street	House # Location	Condition	Risk Rating	Maintenance Recomm.	Notes
1	Norway Maple	30	Emerald Place	Opp. 46	Good	NA	Prune deadwood	Weight and lean to west
2	Silver Maple	37	Emerald Place	44	Good	NA	Prune deadwood	Large dead limb over woods
3	Silver Maple	39	Emerald Place	44	Fair Good	Low	Prune deadwood	Large deadwood over road
4	Silver Maple	36	Emerald Place	42	Good	Low	Prune deadwood	Large deadwood over road
5	White Ash	31	Emerald Place	38	Fair Good	Low	Prune deadwood or remove due to EAB	Tree in decline. Possible emerald ash borer. Possibly out of ROW
6	Silver Maple	14	Emerald Place	38	Good	NA	None	Large broken leader over road. No risk. Remove for aesthetics
7	Silver Maple	68	Emerald Place	34	Good	Low	Reduce crown weight over road	Previous aggressive pruning house side. All weight and lean to road.
8	Silver Maple	67	Emerald Place	34	Good	NA	None	All crown weight to west over woods
9	Silver Maple	49	Emerald Place	32	Good	Low	Prune deadwood and for house clearance	Low limbs encroaching towards house
10	Red Maple	40	Parsons Street	At 1 Exeter	Good	NA	Prune for house clearance	Low limbs encroaching towards house
11	Red Maple	26	Parsons Street	Parsons Park	Fair Poor	Mod	Remove tree	Previous limb failure, decay. Lean and weight over road and wires.
12	Red Maple	38	Emerald Place	Opp. 63	Good	Low	Install support cable	3 main leaders. Possible weak branch attachment. Could be private tree

Lincoln Parcel Trees

No.	Species	DBH	Location	Condition	Risk Rating	Maintenance Recomm.	Notes
1	Norway Maple	14	Woods at Lincoln and Maine	Good	NA	None	Okay. Southeast corner of property
2	Crab apple	18	Woods at Lincoln and Maine	Good	NA	Prune low limbs and deadwood	2 leader tree
3	Black Walnut	16	Woods at Lincoln and Maine	Good	NA	None	Edge of woods next to Tree #2
4	Catalpa	17, 22	Corner of Lincoln and access Rd	Fair Good	Mod	Remove north leader	West leader 35 degree lean to road. Weak branch attachment
5	Catalpa	11	Corner of Lincoln and access Rd	Good	NA	None	Okay. Edge of woods
6	Black Walnut	21	Corner of Lincoln and access Rd	Good	NA	None	Okay. Edge of woods
7	Norway Maple	10	South side of circle drive	Good	NA	None	Okay.
8	Black Walnut	11	South side of circle drive	Good	NA	None	Close to street light wire
9	Black Cherry	12	South side of circle drive at fence	Dead	Mod	Remove tree	Dead. Held up by vines. Next to garage of 35 Maine.
10	Red Maple	41	South side of circle drive near fence	Fair	Mod	Remove tree or install support cables	Large, two leader tree. Previously pruned. Weak attachment at main leaders.
11	Catalpa	15	Woods southeast of circle drive	Good	NA	None	Two main leaders joined at base.
12	Catalpa	16	Woods southeast of circle drive	Good	NA	None	West edge of woods
13	Elm	12	At south fence line	Good	NA	None	Embedded in chain-link fence behind 33 Maine
14	Norway Maple	16	At south fence line	Good	NA	None	Southeast corner of fence. Trunk imbedded
15	Pin Oak	14	Northeast border of property	Good	NA	Prune low limbs and deadwood	Next to sidewalk. Embedded in fence
16	Black Walnut	18	Lincoln St at access drive, north side	Good	NA	None	2 leader tree in lawn area next to garage at 12 Lincoln
17	Norway Maple	16	Southwest side of drive circle	Good	Low	Cut bittersweet vines	Thick vines on tree. Lean and weight to #12 garage

No.	Species	DBH	Location	Condition	Risk Rating	Maintenance Recomm.	Notes
18	Norway Maple	10,10	Southwest side of drive circle	Fair Good	Low	Remove east leader	Two main leaders at 15'. Weak branch attachment
19	Catalpa	7	At fence behind 12 Lincoln	Good	NA	None	West edge of wooded area
20	Hickory	11,10,14	In woods behind 12 Lincoln	Good	NA	None	Grouping of 3 trees
21	Hickory	15	In woods behind 12 Lincoln	Good	NA	None	Close to drive circle
22	Catalpa	17	In woods behind 12 Lincoln	Good	NA	None	Close to drive circle. 20' north of #21
23	Norway Maple	26	In woods behind 12 Lincoln	Fair	Mod	Remove tree	Previous branch failure, decay and cracks. Lean and weigth to 12 Lincoln
24	Norway Maple	8	In woods behind 12 Lincoln	Good	NA	None	Near fence. Broken top
25	Hickory	31	Woods north of drive circle. Next to garage of 23 Federal	Good	Low	Install support cables	Multileader at 20'. Install 2 support cables
26	Norway Maple	26	Behind 23 Federal	Fair Good	Low	Prune limbs over abutting property	Past limb failure. Reduce weight of limbs over abutting property
27	Norway Maple	13	Behind 23 Federal	Fair Good	Low	Remove north leader	2 leaders. Weak branch union. Remove leader over 23 Federal St. yard
28	Sugar Maple	19	Behind 23 Federal	Fair	Low	Monitor for poor health	Possible crown dieback. Declining health
29	Black Walnut	11	Behind 21 Federal	Good	NA	None	At fence line
30	Norway Maple	7,8	Behind 21 Federal	Good	NA	None	At fence line
31	Pin Oak and Elm	17,19	Behind 21 Federal	Good	NA	None	At fence line. Oak and elm grafted at base

Potential Planting Spaces

Address/Location	Qty	Size	Notes
1-3 Broderick	1	Sm	At Everett intersection. Overhead lines
8 Lincoln	2	Med	Front yard
10-12 Lincoln	2	Med	Front yard
46-48 Emerald	2	Sm; Med	Front yard; Overhead lines
42-44 Emerald	2	Sm; Med	Front yard; Overhead lines
38-40 Emerald	1	Med	Front yard
26-28 Emerald	2	Sm; Med	Front yard; Overhead lines
22 Emerald	1	Med	Front yard
18 -20 Emerald	2	Sm; Med	Front yard; Overhead lines
Oakdale at Glen Cove	15-20	Mixed	Open lawn areas both sides
Glen Cove at Exeter	3	Med	Lawn area near road
Exeter at Lincoln	8-10	Mixed	Lawn area near road
Ferry at Emerald	3	Med	Lawn area at intersection
Parson's Park	?	Mixed	Open park area. Arborvitae hedge east boundary

Certification

I certify the statements in this report are, to the best of my knowledge, true, accurate and represent my professional opinion.

Date December 9, 2021

David C. Hawkins, Consulting Arborist

Certified Arborist: Mass. Arborists Association	MCA #1425
International Society of Arboriculture	
Board Certified Master Arborist	ISA #NE-0541-B
Tree Risk Assessment Qualification (TRAQ)	March; 2014; Renewed October 2018
Licensed Arborist: Rhode Island Department of Environmental Management	RI #696
American Society of Consulting Arborists	
Registered Consulting Arborist	RCA #743
Member:	
The Tree Care Industry	
Mass. Tree Wardens and Foresters Assoc	
Executive Board Member	

Disclaimer

By the nature or their size, weight and miscellaneous structure, constant exposure to the weather and the elements, susceptibility to insect's pest and decay organisms, use as homes to birds and animals and other reasons, trees always pose an inherent degree of risk from breakage, failure and other causes and conditions.

Recommendations made by Urban Forestry Solutions, Inc. are intended to minimize, reduce or eliminate hazardous conditions associated with trees. However there is not, and can never be, any guarantee or certainty that these recommendations will totally correct unsafe conditions or prevent failure or breakage of a tree, or that conditions will not change.

The recommendations carried out as stated, should reduce the risk but they cannot completely eliminate it (except when the tree is removed), especially in the event of future growth, further deterioration, subsequent insect attacks, extreme weather conditions, eternal factors, (lightning strikes, fallen objects, vehicular damage, etc.), storms or other acts of God or man.

Appendix D

Drainage System Evaluation/
Green Infrastructure Preliminary Design

FUSS & O'NEILL

MEMORANDUM

TO: Jamie Webb, City of Easthampton

FROM: Lara Sup, PE, Fuss & O'Neill, Inc.
Julianne Busa, PhD, CSE, Fuss & O'Neill, Inc.

DATE: July 20, 2022

RE: **New City Neighborhood Green Infrastructure Preliminary Design**

Fuss & O'Neill has studied the New City neighborhood (New City) drainage system as part of the New City Infrastructure Master Plan. To improve drainage through New City, a hybrid green/gray infrastructure approach will be taken. Green infrastructure practices will infiltrate and treat stormwater for smaller storm events, or the first flush of larger storm events, while an underground storm sewer system will be designed to accommodate larger storm events. It is expected that the New City improvements will be implemented over the course of many years under separate project phases. With this in mind, an overall Concept Plan was developed so the City can complete construction in a cost-effective manner. The purpose of this memorandum is to summarize the stormwater analysis completed for the green infrastructure practices of the Concept Plan. Additional detailed hydrologic modeling and field infiltration testing will be required during engineering design of each phase to properly size underground drainage systems.

The New City neighborhood consists of approximately 60.5 acres. In general the neighborhood slopes east to west from the intersection of Parsons Street and Everett Street in the northwest direction towards Lower Mill Pond. The neighborhood was subdivided into ten smaller subbasins based on a topographical survey completed in January, 2022 and the natural outlet locations from the neighborhood. Some subbasins were subdivided further along the roadways to provide for ease of phasing for future constructions. Attachment A shows the New City neighborhood subbasins.

To size the green infrastructure practices, the Massachusetts Stormwater Handbook and Stormwater Management Standards were followed. The overall design is considered a redevelopment project as it involves the rehabilitation of existing roadway and sidewalk areas while proposing no overall increase in impervious area. The main design criteria used to size the practices is the Water Quality Volume (WQV) standard. This volume was calculated assuming 1" of rainfall over the impervious cover of each subbasin. Bioretention planters, tree filters and rain gardens are proposed throughout New City to store the required WQV to the maximum extent feasible. Table 1 summarizes the results of the analysis and shows how each subwatershed is meeting the Stormwater Standards to the extent practical. Attachment B contains a summary of the impervious area for each subbasin as well as calculations for the proposed planters, tree filters and rain gardens. The Concept Design is included under separate cover as Attachment C.

Table 1
New City Water Quality Volume for Green Infrastructure Practices

Subbasin	WQV required (cu ft)	GI Storage provided (cu ft)	Proposed Storage Volume as a % of WQV
A	958	0	0%
B	2,832	2,370	84%
C	2,001	4,710	235%
D	1,697	1,715	101%
E	4,339	1,547	36%
F	25,763	26,320	102%
G	10,292	3,767	37%
H	7,532	5,465	73%
I	466	0	0%
J	11,185	8,732	78%
Total	67,066	54,626	81%

The locations of green infrastructure have been proposed in the public right of way and City-owned land on the Concept Plan to provide storage volume to the maximum extent possible, or approximately 81% of the Water Quality Volume for the entire neighborhood. During each construction phase of New City, it is expected additional analysis using a hydrologic model will be prepared with precise storage volume sizing for the green infrastructure.

The overall Concept Plan includes the following recommendations:

Emerald Place

- Change to one-way street (north) from Clinton Street to Lincoln Street
- Multi-use path from Lincoln Street to Ferry Street
- Integrate bioretention planters, rain gardens and a landscape belt with formalized parking

Clinton Street

- Change to one-way street (west) with on-street parking on north side only
- 10' wide roadway with 5' sidewalks on both sides
- Incorporate 8' wide on-street bioretention areas into parking

Emerald Street

- Change to one-way street (east) with on-street parking on south side only
- 10' wide roadway with 5' sidewalk
- Incorporate 8' wide on-street bioretention areas into parking

Harrison Avenue

- 20' wide roadway with 5' wide sidewalks on both sides
- Tree box filters incorporated into sidewalks

Lincoln Street

- 22' wide roadway with 8' wide multi-use path long east side, 5' sidewalk on west side
- Combination of 5' and 8' wide bioretention areas, rain gardens and tree box filters

Lewandoski Avenue

- Incorporate 5' wide bioretention areas

Parson Street

- 22' wide roadway with 5' sidewalks on both sides
- Incorporate 5' wide bioretention areas

Maine Avenue

- 22' wide roadway with 5' sidewalk on south side
- 5' wide bioretention areas along north side

Federal Street, Exeter Street and Dartmouth Street

- 20' wide roadway with 5' sidewalk on both sides
- Tree box filters incorporated into sidewalks

Glen Cove Place

- 5' bioretention areas along west side of street
- Narrowing of road and Rain garden/bioretention areas along Emerald Place/Glen Cove Place intersection

Oakdale Place

- 21' wide roadway with 5' sidewalk on both sides
- 5' wide bioretention areas along south side

Federal Street, Exeter Street and Dartmouth Street

- 20' wide roadway with 5' sidewalk on both sides
- Tree box filters incorporated into sidewalks

Unnamed Drive between Parson Street and Glen Cove Place

- 5' wide bioretention areas and rain garden along south side

Parsons Street Park and Lincoln Street Parcel

- Incorporate rain gardens and bioretention areas where possible

The green infrastructure system was designed to maintain parking along streets, calm traffic and provide accessible sidewalks and paths while maximizing stormwater management and infiltration and enhancing the character of the neighborhood. Treebox filters will also provide significant additional tree canopy cover along neighborhood streets for increased shade and cooling. The Concept Design has set up the City for a path forward to phase construction of the improvements in a cost-effective manner street by street.

Attachment A

New City Neighborhood Subbasin Delineations

File: J:\DWG\P20170289\D10\Civil\Figures\New_City_Neighborhood_Subbasin_Delineation\Title_Block_BW.dwg Layout: SUBBASIN_DELIN Plotted: 2022-07-19 4:45 PM Saved: 2022-07-19 4:44 PM User: CNauman
MS VIEW: | LAYER STATE:2022_07_19_Plot | PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB/CTB: FO.STB

PROJ. No.: 20170289.10
DATE: 07/19/2022

EX-001

CITY OF EASTHAMPTON

SUBBASIN DELINEATION

NEW CITY NEIGHBORHOOD

EASTHAMPTON MASSACHUSETTS

FUSS & O'NEILL
1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
413.452.0445
www.fando.com

SCALE:
HORZ.: 1" = 80'
VERT.:
DATUM:
HORZ.:
VERT.:
80 40 0 80
GRAPHIC SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

Attachment B

Calculations of Green Infrastructure Sizing

New City Neighborhood Subbasin Delineation

20170289.D10

Calculated by: CMN 5/12/2022

Checked by: LTS 5/12/2022

A1 **CAD DA: 62119.8** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	11493.0	18.50	18.13
Good	A	39	5654.2	9.10	3.55
Good	B	61	34120.7	54.93	33.51
Good	C	74	0.0	0.00	0.00
Good	D	80	10852.0	17.47	13.98
			62119.8	***100.0***	***69.16***

Total Area: ***1.43 Acres***

0.26 Acres Impervious

Required **WQV=** **957.7 cf**

B1 **CAD DA: 46118.5** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	33987.4	73.70	72.22
Good	A	39	376.0	0.82	0.32
Good	B	61	10927.3	23.69	14.45
Good	C	74	0.0	0.00	0.00
Good	D	80	827.8	1.80	1.44
			46118.5	***100.0***	***88.43***

Total Area: ***1.06 Acres***

0.78 Acres Impervious

WQV= **2832.3 cf**

C1 **CAD DA: 51014.9** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	24017.1	47.08	46.14
Good	A	39	0.0	0.00	0.00
Good	B	61	15632.4	30.64	18.69
Good	C	74	0.0	0.00	0.00
Good	D	80	11365.4	22.28	17.82
			51014.9	***100.0***	***82.65***

Total Area: ***1.17 Acres***

0.55 Acres Impervious

WQV= **2001.4 cf**

D1 **CAD DA: 51858.0** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	20369.3	39.28	38.49
Good	A	39	6336.2	12.22	4.77
Good	B	61	7834.3	15.11	9.22
Good	C	74	0.0	0.00	0.00
Good	D	80	17318.3	33.40	26.72
			51858.0	***100.0***	***79.19***

Total Area: ***1.19 Acres***

0.47 Acres Impervious

WQV= **1697.4 cf**

E1 **CAD DA: 91671.1** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	52069.7	56.80	55.66
Good	A	39	2096.9	2.29	0.89
Good	B	61	27664.2	30.18	18.41
Good	C	74	0.0	0.00	0.00
Good	D	80	9840.4	10.73	8.59
			91671.1	***100.0***	***83.55***

Total Area: ***2.10 Acres***

1.20 Acres Impervious

WQV= **4339.1 cf**

F1 **CAD DA: 62857.0** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	33892.5	53.92	52.84
Good	A	39	0.0	0.00	0.00
Good	B	61	13223.9	21.04	12.83
Good	C	74	15740.6	25.04	18.53
Good	D	80	0.0	0.00	0.00
			62857.0	***100.0***	***84.21***

Total Area: ***1.44 Acres***

0.78 Acres Impervious

WQV= **2824.4 cf**

F2 **CAD DA: 38502.6** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	27882.8	72.42	70.97
Good	A	39	0.0	0.00	0.00
Good	B	61	8682.9	22.55	13.76

WQV= **2323.6 cf**

Good	C	74	1936.8	5.03	3.72
Good	D	80	0.0	0.00	0.00
			38502.6	***100.0***	***88.45***

Total Area: ***0.88 Acres***

0.64 Acres Impervious

F3 **CAD DA:** **26457.5** **Difference:** **0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	19562.6	73.94	72.46
Good	A	39	0.0	0.00	0.00
Good	B	61	6894.9	26.06	15.90
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			26457.5	***100.0***	***88.36***

WQV= **1630.2 cf**

Total Area: ***0.61 Acres***

0.45 Acres Impervious

F4 **CAD DA:** **94397.8** **Difference:** **0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	53894.8	57.09	55.95
Good	A	39	0.0	0.00	0.00
Good	B	61	26785.1	28.37	17.31
Good	C	74	13717.9	14.53	10.75
Good	D	80	0.0	0.00	0.00
			94397.8	***100.0***	***84.01***

WQV= **4491.2 cf**

Total Area: ***2.17 Acres***

1.24 Acres Impervious

F5 **CAD DA:** **25817.3** **Difference:** **0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	17593.1	68.14	66.78
Good	A	39	0.0	0.00	0.00
Good	B	61	6986.6	27.06	16.51
Good	C	74	1237.7	4.79	3.55
Good	D	80	0.0	0.00	0.00
			25817.3	***100.0***	***86.84***

WQV= **1466.1 cf**

Total Area: ***0.59 Acres***

0.40 Acres Impervious

F6 **CAD DA:** **31801.5** **Difference:** **0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	16593.6	52.18	51.14
Good	A	39	0.0	0.00	0.00
Good	B	61	12698.3	39.93	24.36
Good	C	74	2509.6	7.89	5.84
Good	D	80	0.0	0.00	0.00
			31801.5	***100.0***	***81.33***

WQV= **1382.8 cf**

Total Area: ***0.73 Acres***

0.38 Acres Impervious

F7 **CAD DA:** **127651.7** **Difference:** **0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	64822.3	50.78	49.76
Good	A	39	0.0	0.00	0.00
Good	B	61	37255.3	29.19	17.80
Good	C	74	25574.2	20.03	14.83
Good	D	80	0.0	0.00	0.00
			127651.7	***100.0***	***82.39***

WQV= **5401.9 cf**

Total Area: ***2.93 Acres***

1.49 Acres Impervious

F8 **CAD DA:** **21070.7** **Difference:** **0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	15643.1	74.24	72.76
Good	A	39	0.0	0.00	0.00
Good	B	61	5427.6	25.76	15.71
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			21070.7	***100.0***	***88.47***

WQV= **1303.6 cf**

Total Area: ***0.48 Acres***

0.36 Acres Impervious

F9 **CAD DA:** **17573.9** **Difference:** **0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	13145.9	74.80	73.31
Good	A	39	0.0	0.00	0.00
Good	B	61	4428.0	25.20	15.37

WQV= **1095.5 cf**

Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			17573.9	***100.0***	***88.68***

Total Area: ***0.40 Acres***

0.30 Acres Impervious

F10 **CAD DA: 38151.1 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	22311.1	58.48	57.31
Good	A	39	0.0	0.00	0.00
Good	B	61	7490.9	19.63	11.98
Good	C	74	1112.6	2.92	2.16
Good	D	80	7236.6	18.97	15.17
			38151.1	***100.0***	***86.62***

WQV= 1859.3 cf

Total Area: ***0.88 Acres***

0.51 Acres Impervious

F11 **CAD DA: 47145.1 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	23812.4	50.51	49.50
Good	A	39	6635.2	14.07	5.49
Good	B	61	603.3	1.28	0.78
Good	C	74	0.0	0.00	0.00
Good	D	80	16094.2	34.14	27.31
			47145.1	***100.0***	***83.08***

WQV= 1984.4 cf

Total Area: ***1.08 Acres***

0.55 Acres Impervious

G1 **CAD DA: 21364.7 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	12165.3	56.94	55.80
Good	A	39	0.0	0.00	0.00
Good	B	61	9199.4	43.06	26.27
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			21364.7	***100.0***	***82.07***

WQV= 1013.8 cf

Total Area: ***0.49 Acres***

0.28 Acres Impervious

G2 **CAD DA: 58368.5 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	35215.7	60.33	59.13
Good	A	39	0.0	0.00	0.00
Good	B	61	23152.8	39.67	24.20
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			58368.5	***100.0***	***83.32***

WQV= 2934.6 cf

Total Area: ***1.34 Acres***

0.81 Acres Impervious

G3 **CAD DA: 74434.6 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	42807.7	57.51	56.36
Good	A	39	0.0	0.00	0.00
Good	B	61	29007.5	38.97	23.77
Good	C	74	0.0	0.00	0.00
Good	D	80	2619.4	3.52	2.82
			74434.6	***100.0***	***82.95***

WQV= 3567.3 cf

Total Area: ***1.71 Acres***

0.98 Acres Impervious

G4 **CAD DA: 66107.7 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	33319.0	50.40	49.39
Good	A	39	8491.0	12.84	5.01
Good	B	61	12252.2	18.53	11.31
Good	C	74	0.0	0.00	0.00
Good	D	80	12045.5	18.22	14.58
			66107.7	***100.0***	***80.28***

WQV= 2776.6 cf

Total Area: ***1.52 Acres***

0.76 Acres Impervious

H1 **CAD DA: 15977.8 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	10364.0	64.87	63.57
Good	A	39	0.0	0.00	0.00
Good	B	61	5613.8	35.13	21.43

WQV= 863.7 cf

Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			15977.8	***100.0***	***85.00***

Total Area: ***0.37 Acres***

0.24 Acres Impervious

H2 **CAD DA: 17378.4** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	7256.0	41.75	40.92
Good	A	39	0.0	0.00	0.00
Good	B	61	10122.4	58.25	35.53
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			17378.4	***100.0***	***76.45***

WQV= 604.7 cf

Total Area: ***0.40 Acres***

0.17 Acres Impervious

H3 **CAD DA: 34538.5** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	21117.5	61.14	59.92
Good	A	39	557.4	1.61	0.63
Good	B	61	12863.6	37.24	22.72
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			34538.5	***100.0***	***83.27***

WQV= 1759.8 cf

Total Area: ***0.79 Acres***

0.48 Acres Impervious

H4 **CAD DA: 34442.0** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	24243.8	70.39	68.98
Good	A	39	549.9	1.60	0.62
Good	B	61	9648.3	28.01	17.09
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			34442.0	***100.0***	***86.69***

WQV= 2020.3 cf

Total Area: ***0.79 Acres***

0.56 Acres Impervious

H5 **CAD DA: 22092.4** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	11769.7	53.27	52.21
Good	A	39	1885.6	8.54	3.33
Good	B	61	8437.1	38.19	23.30
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			22092.4	***100.0***	***78.83***

WQV= 980.8 cf

Total Area: ***0.51 Acres***

0.27 Acres Impervious

H6 **CAD DA: 40156.4** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	15629.6	38.92	38.14
Good	A	39	24526.8	61.08	23.82
Good	B	61	0.0	0.00	0.00
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			40156.4	***100.0***	***61.96***

WQV= 1302.5 cf

Total Area: ***0.92 Acres***

0.36 Acres Impervious

I1 **CAD DA: 30460.2** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	5589.0	18.35	17.98
Good	A	39	9390.1	30.83	12.02
Good	B	61	15481.1	50.82	31.00
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			30460.2	***100.0***	***61.01***

WQV= 465.7 cf

Total Area: ***0.70 Acres***

0.13 Acres Impervious

J1 **CAD DA: 5079.1** **Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	3754.6	73.92	72.44
Good	A	39	0.0	0.00	0.00
Good	B	61	1324.5	26.08	15.91

WQV= 312.9 cf

Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			5079.1	***100.0***	***88.35***

Total Area: ***0.12 Acres***

0.09 Acres Impervious

J2 **CAD DA:** **15945.4** **Difference:** **0.0** **WQV=** **1056.7 cf**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	12680.9	79.53	77.94
Good	A	39	0.0	0.00	0.00
Good	B	61	3264.5	20.47	12.49
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			15945.4	***100.0***	***90.42***

Total Area: ***0.37 Acres***

0.29 Acres Impervious

J3 **CAD DA:** **9061.6** **Difference:** **0.0** **WQV=** **635.6 cf**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	7627.3	84.17	82.49
Good	A	39	0.0	0.00	0.00
Good	B	61	1434.3	15.83	9.66
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			9061.6	***100.0***	***92.14***

Total Area: ***0.21 Acres***

0.18 Acres Impervious

J4 **CAD DA:** **16600.4** **Difference:** **0.0** **WQV=** **565.4 cf**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	6784.5	40.87	40.05
Good	A	39	0.0	0.00	0.00
Good	B	61	9815.9	59.13	36.07
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			16600.4	***100.0***	***76.12***

Total Area: ***0.38 Acres***

0.16 Acres Impervious

J5 **CAD DA:** **20558.7** **Difference:** **0.0** **WQV=** **1171.0 cf**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	14052.4	68.35	66.99
Good	A	39	0.0	0.00	0.00
Good	B	61	6506.3	31.65	19.30
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			20558.7	***100.0***	***86.29***

Total Area: ***0.47 Acres***

0.32 Acres Impervious

J6 **CAD DA:** **40740.0** **Difference:** **0.0** **WQV=** **875.7 cf**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	10508.9	25.80	25.28
Good	A	39	0.0	0.00	0.00
Good	B	61	30231.1	74.20	45.26
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			40740.0	***100.0***	***70.54***

Total Area: ***0.94 Acres***

0.24 Acres Impervious

J7 **CAD DA:** **34710.8** **Difference:** **0.0** **WQV=** **1869.7 cf**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	22436.8	64.64	63.35
Good	A	39	0.0	0.00	0.00
Good	B	61	12273.9	35.36	21.57
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			34710.8	***100.0***	***84.92***

Total Area: ***0.80 Acres***

0.52 Acres Impervious

J8 **CAD DA:** **10643.8** **Difference:** **0.0** **WQV=** **811.2 cf**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	9734.1	91.45	89.62
Good	A	39	0.0	0.00	0.00
Good	B	61	909.7	8.55	5.21

Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			10643.8	***100.0***	***94.84***

Total Area: ***0.24 Acres***

0.22 Acres Impervious

J9 **CAD DA: 12955.9 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	10363.3	79.99	78.39
Good	A	39	0.0	0.00	0.00
Good	B	61	2592.6	20.01	12.21
Good	C	74	0.0	0.00	0.00
Good	D	80	0.0	0.00	0.00
			12955.9	***100.0***	***90.60***

WQV= 863.6 cf

Total Area: ***0.30 Acres***

0.24 Acres Impervious

J10 **CAD DA: 67786.5 Difference: 0.0**

Condition	Soil Group	CN No.	Area (S.F.)	% of Total Area	Comp. CN
N/A	N/A	98	36277.9	53.52	52.45
Good	A	39	0.0	0.00	0.00
Good	B	61	6453.6	9.52	5.81
Good	C	74	25055.0	36.96	27.35
Good	D	80	0.0	0.00	0.00
			67786.5	***100.0***	***85.61***

WQV= 3023.2 cf

Total Area: ***1.56 Acres***

0.83 Acres Impervious

New City Neighborhood Preliminary Hydrologic Analysis
Green Infrastructure Calculations
Easthampton, Massachusetts

Calculated by: CMN 5/12/2022
Checked by: LTS 5/12/2022

based on plan: \\private\DFS\Projectdata\P2017\0289\D10\Graphics\Easthampton GI Planning Cor

Watershed	Required WQV (cf)	# Treebox Filter (4'x5')	Length 7' Wide Bioretention Planter (ft)	Length 4' Wide Bioretention Planter (ft)	Length 3' Wide Bioretention Planter (ft)	Irregular Shape Bioretention Planter(s) (sf)	Total WQV Treated (cf)	Remaining WQV Needed (cf)
A1	958	0	0	0	0	0	0	958
B1	2832	0	50	0	0	1012	2369.88	462
C1	2001	0	48	0	0	2370.7795	4709.79633	-2708
D1	1697	0	0	0	0	985.6922	1715.10443	-18
E1	4339	12	0	0	0	649.2588	1547.31031	2792
F1	2824	7	74	74	0	0	1659.96	1164
F2	2324	2	70	68	0	33	1452.9	871
F3	1630	0	0	100	0	0	696	934
F4	4491	0	0	73	0	410.7793	1222.83598	3268
F5	1466	0	0	0	0	258	448.92	1017
F6	1383	0	0	0	0	0	0	1383
F7	5402	2	0	268	0	7860.2264	15611.6739	-10210
F8	1304	14	0	0	0		487.2	816
F9	1095	13	0	0	0	0	452.4	643
F10	1859	5	105	50	0	0	1800.9	58
F11	1984	3	0	115	0	909.1577	2486.7344	-502
G1	1014	6	0	0	0	0	208.8	805
G2	2935	16	0	0	0	0	556.8	2378
G3	3567	23	0	0	0	0	800.4	2767
G4	2777	0	60	60	0	605	2201.1	575
H1	864	0	0	80	0	0	556.8	307
H2	605	0	0	0	0	0	0	605
H3	1760	0	0	160	0	708	2345.52	-586
H4	2020	0	0	185	0	0	1287.6	733
H5	981	0	0	0	0	733	1275.42	-295
H6	1302	0	0	0	0	0	0	1302
I1	466	0	0	0	0	0	0	466
J1	313	0	0	50	0	0	348	-35
J2	1057	0	0	140	0	0	974.4	82
J3	636	0	0	60	0	0	417.6	218
J4	565	0	0	150	0	0	1044	-479
J5	1171	24	0	0	0	0	835.2	336
J6	876	0	0	130	0	414.3676	1625.79962	-750
J7	1870	0	0	191	0	0	1329.36	540
J8	811	0	0	40	0	0	278.4	533
J9	864	0	0	85	0	0	591.6	272
J10	3023	0	0	185	0	0	1287.6	1736
	67066						54626	19%
A	958						0	958
B	2832						2370	462
C	2001						4710	-2708
D	1697						1715	-18

E	4339		1547	2792
F	25763		26320	-557
G	10292		3767	6525
H	7532		5465	764
I	466		0	466
J	11185		8732	

Appendix E

Water System Inspections Summary of Findings and Recommendations

FUSS & O'NEILL

MEMORANDUM

TO: Jamie Webb, Assistant Planner, City of Easthampton

FROM: Kevin M. Flood, Jason Hofmann

DATE: April 22, 2022

RE: City of Easthampton, MA New City Neighborhood - Water System Inspections
Summary of Findings and Preliminary Recommendations

Objectives:

The primary objectives of this Water System investigation were to perform Hydrant Flow Testing at 18 hydrants within the neighborhood and document the hydrants condition. The City's Water Staff assisted RH White Construction Company personnel in operating the valves and hydrants for the fire flow tests. The City did not want to run the fire flows for a long period of time due to their concerns with regard to pipe and hydrant conditions. The hydrants were slowly opened and flowed for a short period of time to see if there was a significant loss in pressure when the hydrant was opened. The pressure in the system was in the range of 92 to 100 psi before hydrants were opened and the system pressure only dropped slightly when the hydrants were opened: typically, 3 to 6 psi. A summary of the hydrants evaluated is shown in Figure 1 and Figure 2. The results of the fire flow testing are summarized in Table 1.

Figure 1 – Hydrants Investigated in New City Neighborhood

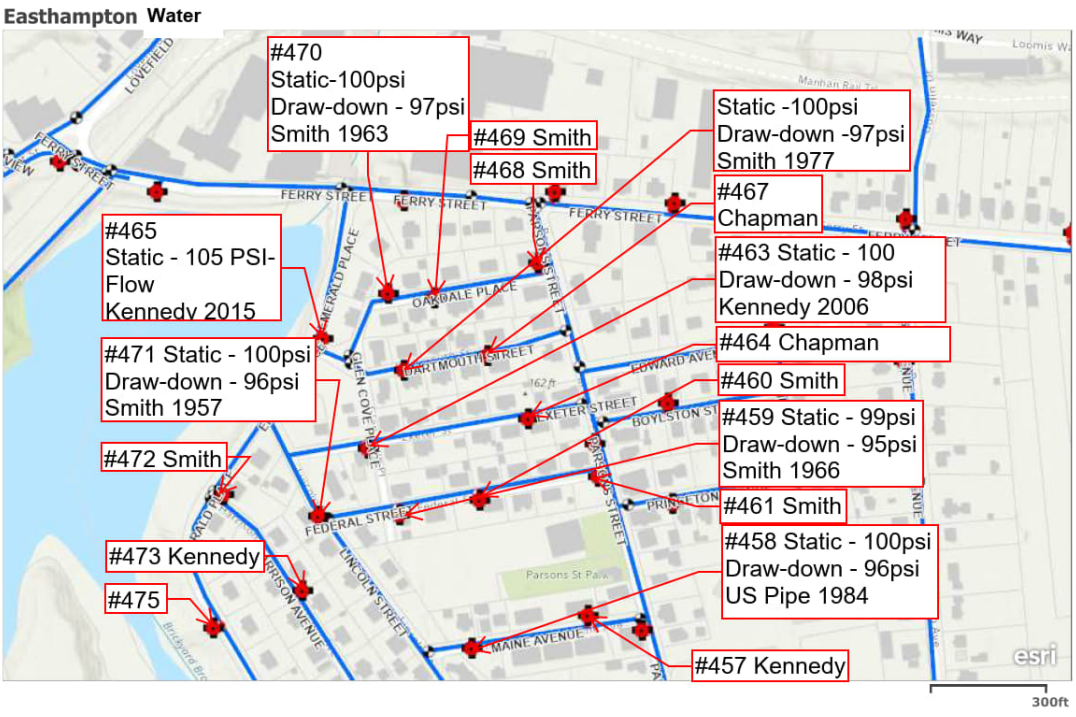


Figure 2 - Hydrants Investigated in New City Neighborhood

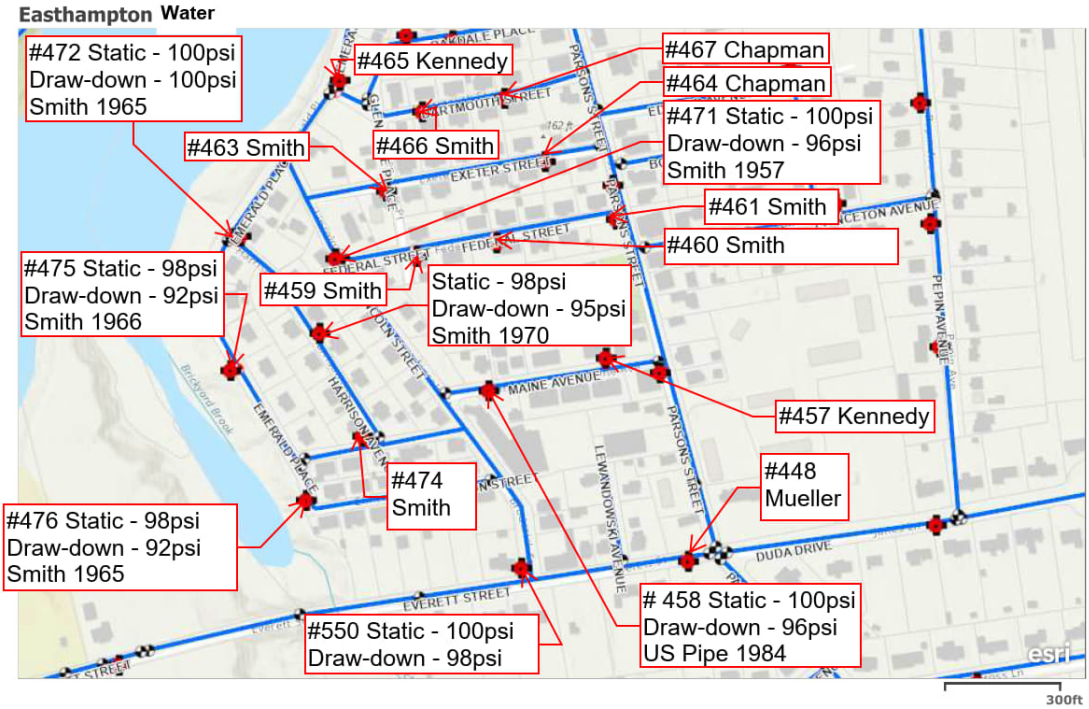


Table 1 - Summary of Hydrant Flows and Pressures

Emerald Place

Hydrant #465 Kennedy 2015 Static Pressure 105 psi
Hydrant #472 Smith - Static 100 psi; Residual 100 psi
Hydrant #475 Smith 1966 – Static 98 psi; Residual 92 psi

Oakdale Place

Hydrant #470 Smith 1963 - Static Pressure 100 psi - Residual 97 psi
Hydrant #469
Hydrant #468

Dartmouth Street

Hydrant #466 Smith 1977 Static Pressure 100 psi Residual 97 psi
Hydrant #467 Chapman [3]

Exeter Street

Hydrant #463 Kennedy 2006 – Static 100 psi; Residual 98 psi
Hydrant #464 Chapman[3]

Federal Street

Hydrant #471 Smith 1957 – Static 100 psi; Residual 96 psi
Hydrant #459 Smith 1966 – Static 99 psi; Residual 95 psi
Hydrant #460 Smith
Hydrant #461 Smith

Harrison Avenue

Hydrant #472 Smith 1965 – Static 100 psi; Residual 100 psi
Hydrant #473 Smith 1970 – Statis 98 psi; Residual 95 psi

Conton Street

Hydrant #476 Smith 1965 – Static 98 psi; Residual 92 psi

Maine Avenue

Hydrant #458 - USA Pipe 1984 – Static 100 psi; Residual 96 psi
Hydrant #457 Kennedy

Everett Street

Hydrant #550 Static 100 psi; Residual 98 psi
Hydrant #448

Ferry Street

Hydrant just west of Manhan Trail – Was able to Flow at 1,200 gpm and there was no appreciable change in Tank levels

General Notes:

1. Hydrant Information: Manufacturer and Year of installation provided
2. Static pressure taken prior to hydrant being opened and flowed
3. Chapman Hydrants were not operated. City did not want to operate them due to age/poor condition
4. Smith and Kennedy Hydrants, while old, were in fair to good condition.
5. Flows could not be measured due to short duration of the hydrants being open.

Results and Discussion

Pressures in the system were appropriate; readings of 100 psi were found in much of the system. This type of pressure is typical for overall operations. The City stated that the distribution system in this neighborhood is flushed annually and there do not seem to be any issues in the distribution system.

Because the system has higher than typical pressures, most homes have pressure reducing valves (PRVs) installed to reduce the flow entering the home. The City has stated that residents have complained of lower pressure and flows at their homes. This could be a function of pressure reducing valves and the

type and age of piping in homes interior plumbing (galvanized or lead). Often, this type of piping has tuberculation (narrowing of the pipe inside diameter due to deposition of solids) which results in lower flows and pressures in homes.

The City has four (4) types of hydrants in the neighborhood. Most of the hydrants are either Smith or Kennedy hydrants that range in age from the mid-1960s until the early 2000s. The other two hydrants are a USA Pipe hydrant from 1984 and the Chapman hydrants, which are the oldest in the system. The City did not flow any of the Chapman hydrants. The Water Department staff did not feel comfortable with touching these because of their age and poor condition.

Details of the hydrant testing includes the following:

1. Hydrants that were flowed were only opened for approximately 1 minute before being shut slowly so as not to cause water hammer in the system.
2. Some streets only had one hydrant opened/operated.
3. After operating some hydrants, they were leaking and had to be re-sealed before being shut to eliminate leaking.

The piping in the system is a mix of 4-inch, 6-inch, 8-inch and 12-inch pipe that is made of asbestos cement and cast iron. The piping in the system is much older in age (approximately 100 years old) and there are not many valves in the system. Due to the age of the valves in the system, the City was not comfortable operating them. For example, no valves along Parson Street were operated or opened during the field work.

Even though hydrants were not flowed for a long period of time, there is significant storage in the system which is why system pressures did not fluctuate when hydrants were opened, and residual pressures were measured. If the hydrants were allowed to flow for longer periods of time, more pressure drops would have been realized.

Preliminary Recommendations

The system's age, the condition of the existing hydrants and the lack of valving within the system will make modifications necessary to the system more difficult to complete due to the limited ability to isolate portions of the system without losing service to customers during construction of improvements. The following improvements are recommended as an initial step:

1. The system within the neighborhood has a mix of piping sizes. The minimum size of piping to be used moving forward should be 8 inches and the material should be ductile iron.
2. Since there is not a lot of valving in the system to isolate or minimize the number of outages if improvements are needed, the City should investigate existing valves and consider installing insertion valves to provide the ability to isolate parts of the system. The steps proposed for

completing the improvements are Shown in **Figure 3**. They are outlined in more detail below. The initial efforts are to use insertion valves to replace the oldest hydrants:

A. Intersection of Exeter St. and Lincoln St., Intersection of Parsons St., and Exeter St. - These valves will allow Exeter to be isolated while Hydrant # 464 (Chapman) is replaced.

B. Intersection of Oakdale Pl., Dartmouth St. and Glen Cove Pl., Intersection of Parsons St., and Dartmouth St. -These insertion valves will allow Dartmouth to be isolated while Hydrant # 467 (Chapman) is replaced.
    i. Once the hydrants are replaced and the insertion valves are installed, the existing 6-inch water main on these streets should be replaced with new 8-inch cement lined ductile iron piping using the hydrants to install temporary piping along the street and temporary services to the homes to maintain service while the new main is installed. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

3. This procedure would continue for other hydrants and mains in the neighborhood:

C. Intersection of Federal St. and Lincoln St., Intersection of Parsons St., and Federal St. - These insertion valves will allow Federal to be isolated while four (4) Hydrants (# 471, #459, #460 and #461 are replaced.
    i. Once the hydrants are replaced and the insertion valves are installed, the existing 6-inch water main on this street should be replaced with new 8-inch cement lined ductile iron piping using the hydrants to install temporary piping along the street and temporary services to the homes to maintain service while the new main is installed. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

D. Intersection of Oakdale Pl. and Glen Cove Pl., Intersection of Parsons St., and Oakdale Pl. These insertion valves will allow Oakdale Pl. to be isolated while Hydrants # 470, #469, and #468 are replaced.
    i. Once the hydrants are replaced and the insertion valves are installed, the existing 6-inch water main on Oakdale Pl. should be replaced with new 8-inch cement lined ductile iron piping using the hydrants to install temporary piping along the street and temporary services to the homes to maintain service while the new main is installed. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

E. Investigate existing valves at intersection of Emerald Place and Ferry Street, Dartmouth St. and Emerald Pl., Lincoln St. and Emerald Pl., Harrison Ave. and Emerald Pl., and

Figure 3
Recommendations for Sequence of Improvements for Water System

Notes:

1. All Proposed Mains in Neighborhood will be 8-inch Ductile Iron
2. Lewandowski Ave. main will be 6 inch Ductile Iron
3. Parsons St will be 12-inch Ductile Iron
4. Ferry Street will be 12-inch Ductile Iron

Emerald Pl. just north of Clinton St. Depending on operability of valves at these intersections, provide insertion valves to isolate portions of Emerald Pl. to replace hydrants. Hydrants include #465, #472, #475 and #476.

i. Once the hydrants are replaced and the operability of the existing valves is known or the installation of insertion valves are completed, the existing 8-inch water main on Emerald Pl. should be replaced with new 8-inch cement lined ductile iron piping using the hydrants to install temporary piping along the street and temporary services to the homes to maintain service while the new main is installed. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

F. Investigate existing valves at intersection of Emerald Pl. and Harrison Ave., Harrison Ave. and Emerald Pl. Depending on operability of valves at these intersections, provide insertion valves to isolate Harrison Ave. to replace hydrants. Hydrants include #473 and #474.

i. Once the hydrants are replaced and the operability or the installation of insertion valves are completed, the existing 6-inch water main on Harrison Ave. should be replaced with new 8-inch cement lined ductile iron piping using the hydrants to install temporary piping along the street and temporary services to the homes to maintain service while the new main is installed. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

G. Investigate existing valves along Lincoln St and Broderick St. Depending on operability of valves on Lincoln St., provide insertion valves to isolate portions of Lincoln St. to replace hydrants. Hydrants include #471 and #550.

i. Once the hydrants are replaced and the operability or the installation of insertion valves are completed, the existing 4-inch water main on Lincoln St. should be replaced with new 8-inch cement lined ductile iron piping using the hydrants to install temporary piping along the street and temporary services to the homes to maintain service while the new main is installed. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

H. Investigate existing valves along Everett St from Brickyard Brook to the intersection of Parson St. Depending on operability of valves on Everett St., provide insertion valves to isolate portions of Everett St. to replace hydrants. Hydrant #448 should be replaced. Hydrant #550 on Lincoln St. can be used once it is replaced.

i. Once the hydrants are replaced and the operability or the installation of insertion valves are completed, the existing 8-inch water main on Everett St. should be replaced with new 8-inch cement lined ductile iron piping using the hydrants to install temporary piping along the street and temporary services to

the homes to maintain service while the new main is installed. The new main will also be used to replace the existing 2 inch galvanized main on Lewandowski Ave. with 6-inch cement lined ductile iron pipe. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

I. Use Hydrant #476 and Hydrant #550 that have been replaced to provide temporary Water for Clinton Street. Provide temporary services from temporary main to maintain service. Isolate the existing 6-inch main on Clinton Street with insertion valves installed. Replace water main with new 8-inch cement lined ductile iron water main. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

J. Use Insertion Valve at Intersection of Lincoln St. and Maine Ave. and install insertion valve at Intersection of Maine Ave. and Parsons St. These insertion valves will allow Maine Ave. to be isolated while Hydrant # 458 and #457 can be replaced.
    i. Once the hydrants are replaced and the insertion valves are installed, the existing 6-inch water main on Maine Ave. should be replaced with new 8-inch cement lined ductile iron piping using the hydrants to install temporary piping along the street and temporary services to the homes to maintain service while the new main is installed. Existing services will be replaced from the main to the property line. A new curb valve and box will be installed.

K. With the installation of insertion valves at intersections and the hydrants throughout the neighborhood being replaced, the water mains along Parson St. will then need to be replaced. This will be done using the feeds from Emerald Pl, Ferry St., and Everett St. Additional analysis will be needed to determine the need for valves in the road and the other side streets to the east of Parson St. Analysis will also be needed to determine if the parallel mains in Parson St. are still needed or whether one 12-inch main will be sufficient.
    i. Investigation of the other utilities in Parsons St. is needed to determine how the water main replacement will be completed and fit in conjunction with other utilities including sewer, storm drainage and natural gas.

L. Investigate the water mains on Ferry Street to determine the mains that need to be removed and the connections that need to be completed or replaced to upgrade the distribution system connecting to the neighborhood. There is 4-inch and 6-inch main in Ferry Street that should be removed. The 8-inch main that connects Ferry to the 12-inch main on Parsons should be removed and replaced with a 12-inch connection that includes a gate valve. The services in this area will need to be replaced and connected to the 12-inch main along Ferry Street.

Appendix F

Sewer Field Inspections Summary of Findings and Recommendations

FUSS & O'NEILL

MEMORANDUM

TO: Jamie Webb, Assistant Planner, City of Easthampton

FROM: Jason Hofmann, Kevin M. Flood

DATE: February 28, 2022

RE: City of Easthampton, MA New City Neighborhood - Sewer Field Inspections
Summary of Findings and Preliminary Recommendations

Objectives:

The primary objectives of this Sewer investigation were to perform closed-circuit television (CCTV) inspections and structurally rate approximately 11,000 feet of sewer infrastructure located in the New City Neighborhood in Easthampton, MA. The CCTV data will be used to prioritize and focus future efforts on the sewers that need immediate attention.

CCTV

Truax Corporation was selected to perform the CCTV digital video pipeline inspection. Fuss & O'Neill utilized the National Association of Sewer Service Companies (NASSCO'S) Pipeline Assessment Certification Program (PACP), Lateral Assessment Certification Program (LACP) and Manhole Assessment Certification Program (MACP) for proper and consistent condition assessment and coding of pipelines, laterals, and manholes. The goal of these programs is to help pipeline owners create a comprehensive database to properly identify, plan, prioritize, manage, and renovate their assets based on this condition evaluation. This allows for the most consistent and thorough collection of data.

Under this program, a CCTV crew gathered video and data for each pipe segment within the neighborhood to identify deficiencies and defects. Fuss & O'Neill then reviewed the tapes and video logs to determine if the sewer facilities should be repaired, replaced immediately or scheduled for future improvements.

Benefits

This program utilizes state-of-the art digital video technology to inspect and identify the existing condition of the sewer collection system and simplify the prioritization of wastewater management improvements.

Rating System

This program uses the Pipeline Assessment and Certification Program (PACP) rating system, which was developed by the National Association of Sewer Service Companies (NASSCO). PACP requires CCTV operators to code defects either by infrastructure or maintenance defects. Each defect code is assigned a grade of 1 to 5 with 1 being the least severe and 5 being the most severe defect. These grades only

consider the internal pipe conditions obtained from the televised inspection. After a sewer segment has been inspected, several grading systems can be applied to determine the most severe pipe segments.

Condition Grading Systems

One of the Condition Grading Systems most used is the Quick Rating System. This indicates the number of occurrences for the two (2) highest severity grades for each pipe segment for both maintenance and infrastructure defects identified. A grade of 1 indicates that a pipe segment is in excellent condition with minor defects and failure is unlikely in the foreseeable future, while a grade of 5 indicates that a pipe segment may require immediate attention. Using the Quick Ratings, we can determine the priority list for maintenance efforts and infrastructure repairs.

A detailed breakdown of the five possible defect grades and their estimated time to failure is as follows:

Grade 1: *Excellent*, Minor Defects
Grade 2: *Good*, Defects that have not begun to deteriorate.
Grade 3: *Fair,* Moderate Defects that will continue to deteriorate.
Grade 4: *Poor*, Severe Defects that will become grade % defects within the foreseeable future.
Grade 5: *Immediate Attention*, Defects requiring immediate attention.

Takeaways

A summary of the streets videoed, the segments investigated between the Upstream and Downstream Manholes, an Overall Pipe Rating, the Quick Rating described above, Pipe Material, Size of Pipe, and Inspected Length are included in the table shown on the next page.

RED: Areas of immediate concern are highlighted in Table 1 below. They include the following:

- Parsons Street
- Exeter Street
- Broderick Street
- Harrison Avenue
- Maine Avenue
- Lewandowski Avenue
- Emerald Place
- Oakdale Place
- Federal Avenue
- Glen Cove Place

Table 1 – Summary of Video Inspection Results and Ratings

Easthampton, MA - New City 2021 CCTV 20170289.D10								
US MH	DS MH	Overall Pipe Rating	Quick Rating	Date	Street	Material	Size	Inspected Length
55	56	80	3A2C	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	109.3
29	53	48	312C	11/16/2021	Exeter St.	Vitrified Clay Pipe	10	256.8
51	52	28	322A	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	202.8
43	45	27	322A	11/15/2021	Broderick St.	Vitrified Clay Pipe	8	191.1
21	22A	17	311A	11/15/2021	Harrison Ave.	Vitrified Clay Pipe	8	224.3
32	28	28	4232	11/15/2021	Exeter St.	Vitrified Clay Pipe	8	118.1
39	40	10	4131	11/16/2021	Maine Ave.	Vitrified Clay Pipe	8	327.2
46A	46	15	4131	11/17/2021	Lewandowski Ave.	Vitrified Clay Pipe	8	198.8
36	36A	40	4131	11/15/2021	Emerald Pl.	Vitrified Clay Pipe	8	346.2
18	57	11	4122	11/16/2021	Oakdale Pl.	Vitrified Clay Pipe	12	132.3
33	32	6	4121	11/16/2021	Federal St.	Vitrified Clay Pipe	8	74.9
24	25	13	4121	11/15/2021	Harrison Ave.	Vitrified Clay Pipe	8	116.5
17	18	8	4114	11/15/2021	Glen Cove Pl.	Vitrified Clay Pipe	12	209.8
56	57	36	3727	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	169.1
44	45	25	3327	11/17/2021	Everett St.	Vitrified Clay Pipe	15	298.2
38	39	16	3225	11/16/2021	Maine Ave.	Vitrified Clay Pipe	8	110.9
41	42	21	3223	11/15/2021	Clinton St.	Vitrified Clay Pipe	8	268.3
53	54	10	3222	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	11
36A	24	12	3122	11/15/2021	Emerald Pl.	Vitrified Clay Pipe	8	340.3
31	32	8	3122	11/16/2021	Federal St.	Vitrified Clay Pipe	8	230.3
22	23	7	3121	11/15/2021	Harrison Ave.	Vitrified Clay Pipe	8	121
42	43	8	3121	11/15/2021	Broderick St.	Vitrified Clay Pipe	8	93.8
20	56	8	3121	11/16/2021	Oakdale Pl.	Vitrified Clay Pipe	10	228.6
30	31	3	3100	11/16/2021	Federal St.	Vitrified Clay Pipe	8	94.1
52	53	3	3100	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	6.5
19	20	9	2313	11/16/2021	Oakdale Pl.	Vitrified Clay Pipe	10	261.1
45	46	7	2311	11/17/2021	Everett St.	Vitrified Clay Pipe	15	237.1
41A	41	8	2214	11/15/2021	Clinton St.	Vitrified Clay Pipe	8	198
22A	22	6	2114	11/15/2021	Harrison Ave.	Vitrified Clay Pipe	8	228.8
23	24	5	2113	11/15/2021	Harrison Ave.	Vitrified Clay Pipe	8	109
34	33	2	2100	11/16/2021	Federal St.	Vitrified Clay Pipe	8	47.5

Table 1 – Summary of Video Inspection Results and Ratings

Easthampton, MA - New City 2021 CCTV 20170289.D10								
US MH	DS MH	Overall Pipe Rating	Quick Rating	Date	Street	Material	Size	Inspected Length
9	28	2	2100	11/15/2021	Exeter St.	Vitrified Clay Pipe	8	171.6
28	29	2	2100	11/15/2021	Exeter St.	Vitrified Clay Pipe	10	223.6
27	13	2	2100	11/15/2021	Glen Cove Pl.	Vitrified Clay Pipe	12	254
10	9	2	1200	11/15/2021	Dartmouth St.	Vitrified Clay Pipe	8	251.8
47	48	1	1100	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	270.6
50	51	1	1100	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	268.6
40	50	0	0	11/16/2021	Maine Ave.	Vitrified Clay Pipe	8	61
Cap	9	0	0	11/15/2021	Dartmouth St.	Vitrified Clay Pipe	8	8
13	16	0	0	11/15/2021	Glen Cove Pl.	Vitrified Clay Pipe	12	184.1
16	17	0	0	11/15/2021	Glen Cove Pl.	Vitrified Clay Pipe	12	45.5
25	26	0	0	11/15/2021	Exeter St.	Vitrified Clay Pipe	12	44
26	27	0	0	11/15/2021	Exeter St.	Vitrified Clay Pipe	12	186.6
48	49	0	0	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	146.3
49	50	0	0	11/17/2021	Parsons St.	Vitrified Clay Pipe	12	124.4
46	47	0	0	11/17/2021	Everett St.	Vitrified Clay Pipe	15	239.3

Green — Good: Minor Defects

Yellow — Fair: Moderate defects will continue to deteriorate

Orange — Poor: Severe defects that will become red within the foreseeable future

Red — Immediate Attention: Defects requiring immediate attention

Other System Deficiencies

Parson St Capacity issues

Flows from the west side of Everett Street are carried to Parsons Street via a 15-inch Siphon. Wastewater flows from the East side of Everett Street are carried to Parsons Street via an 8-inch pipe. An 8-inch pipe carries the wastewater flows from the south side of Everett Street to the Parsons Street intersection. These combined flows from the 15-inch and the two 8-inch pipes are entering a manhole at the intersection of Everett and Parsons. Wastewater then flows down Parsons Street in a 12-inch vitrified clay pipe towards Ferry Street accepting flows from the New City Neighborhood as well as Edward Avenue, Boylston Street, Sherman Avenue, Princeton Avenue, and surrounding properties along Parsons Street. There is significant surcharging occurring on Parsons Street because of the sewer

line on Parsons Street being undersized. Further discussion is needed to address the surcharging occurring because of the undersized sewer mains from the intersection of Everett Street and Parsons Street up to Ferry Street and then travelling to the Wastewater Treatment Facility.

New City Neighborhood

Sewers are located through the backyards of properties in between Oakdale Place and Dartmouth Street. There is also a sewer main that is located through the backyards of the properties in-between Harrison Avenue and Emerald Place and between Lincoln Street and Harrison Avenue. These three sewer lines are difficult to maintain with no easements for access. Further, during the CCTV investigation, a manhole was discovered in a garage in the Southwest corner of the neighborhood adjacent to Glen Cove Place.

At the very least, easements should be developed and acquired for the sewers running through backyards so the City can have access in case maintenance or repairs is needed. The area around the sewer between Harrison and Emerald Place is more open, and access is available if maintenance is needed. The others, in between Oakdale Place and Dartmouth Street and Lincoln Street and Harrison Avenue are much less open, with many obstacles that would interfere with access and maintenance, if necessary, and would be much harder to access for sewer replacement or maintenance going forward.

Preliminary Recommendations

The following preliminary recommendations have been developed for the sewer system:

1. Sewer piping in the neighborhood that has been found to be in poor condition will be replaced with the same sized pipe and new manholes.

2. The exact sequence for the sewers to be replaced will depend on the other infrastructure being replaced in the neighborhood. Some may be replaced due to their age and material of construction even if the rating for the sewers does not require immediate attention. This will be identified further as the overall project continues.

3. Develop and obtain easements, where needed, for backyard sewer runs that currently exist.

    a. The first is between the homes on Oakdale Place and Dartmouth Street.
    b. The second is between Harrison Avenue and Emerald Place.
    c. Third is between Lincoln Street and Harrison Avenue

    The route between Oakdale Place and Dartmouth Street is filled with fencing, pools, trees, sheds, and stored materials. An easement may be difficult to obtain in the area and the effort to clean an easement path may be difficult given what currently is in place. The are 3 manholes

that connect the 10-inch vitrified clay piping. One is on Glen Cove Place; one is at Parsons Street and the third is halfway between Glen Cove and Parsons in the back yard sewer run.

a. First rear yard sewer segment - between Oakdale Place and Dartmouth Street - includes two Segments: MH 19 to MH20 and MH 20 to MH 56. See **Figure 1** below. Based on the evaluation we completed and the PACP Analysis and findings summarized in the Table included above - MH 19 to MH20 is color coded to Yellow. This means the condition of the pipe is fair. There are moderate defects that will continue to deteriorate. The second segment; MH 20 to MH 56 is color coded to Orange. This means the condition is poor. This has severe defects that will require immediate attention in the foreseeable future. Given this is downstream of the first segment, this rear yard sewer will need to be modified.

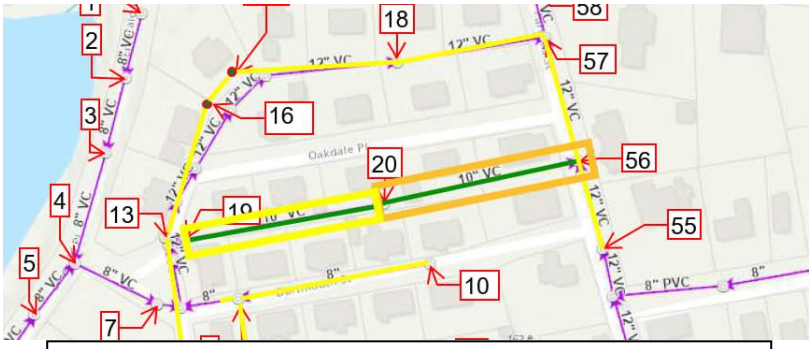


Figure 1
Backyard Sewer Between Oakdale Pl. and Dartmouth St.

The route between Harrison Avenue and Emerald Place is clear for the first half of the run starting at Harrison and heading southeast. About 3 houses southeast from Harrison near Emerald Place, the backyards are filled with large, mature trees, fences, sheds, and stored materials that are between the homes on the two streets. Again, an easement may be difficult to obtain and the effort to clean an easement path may be difficult given what currently is in place. There are 4 manholes that connect the 8-inch vitrified clay pipe from the intersection of Harrison Avenue to Emerald Place. The first is on Emerald Place, the other is on the far end of Emerald Place, and there are two within the backyard run of the sewer.

b. The second rear yard sewer segment - between Harrison Avenue and Emerald Place consists of three segments: MH23 to MH 22, MH22 to MH 22A and MH 22A to MH 21. See **Figure 2**. Based on the evaluation we completed and the PACP Analysis and findings summarized in the Table included above - MH23 to MH 22 is color coded to Orange. This means the condition is poor. This has severe defects that will require immediate attention in the foreseeable future. The second segment, MH22 to MH 22A is color coded to

Yellow. This means the condition of the pipe is fair. There are moderate defects that will continue to deteriorate. The last segment, MH 22A to MH 21 is color coded to Red. This means the condition is poor. The condition and defects are such that immediate attention is needed.

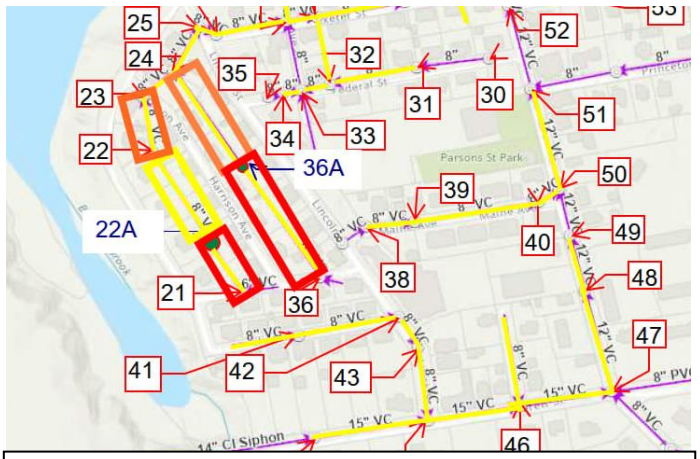


Figure 2
Backyard Sewer Between Harrison Ave. and Emerald Pl.
Backyard Sewer Between Lincoln St. and Harrison Ave.

The route between Lincoln Avenue and Harrison Avenue has many obstacles through the length of the run. Initially there are mature trees, and fencing. This gets even more cluttered with fencing, sheds, larger buildings/garages, stored materials, trees, landscaping, and vehicles. An easement for this route may also be difficult to obtain and the effort to clean an easement path may be difficult given what currently is in place. There are 3 manholes that connect the 8-inch vitrified clay pipe from one end of Emerald Place to the other end. There is only 1 manhole in the backyard area.

c. The third rear yard sewer segment - between Lincoln Street and Harrison Avenue - There are two segments: MH24 to MH 36A and, MH36A to MH 36. See **Figure 2**. Based on the evaluation we completed and the PACP Analysis and findings summarized in the Table included above - MH24 to MH 36A is color coded to Orange. This means the condition is poor. This has severe defects that will require immediate attention in the foreseeable future. The second segment, MH36A to MH 36 is color coded to Red. This means the condition is extremely poor. The condition and defects are such that immediate attention is needed. This rear yard sewer segment will need to be modified.

Based on City information, it appears easements are in place. The City would work with the residents that have rear yard sewers and services and develop a plan to replace the aging infrastructure and services. In order for this to be accomplished, the Easement areas would need to be cleared of fencing, sheds and other materials stored in the easement areas, so the sewer path can be cleared for the sewers to be replaced. Once the sewers and service connections are replaced and restored, the easement area would be restored and maintained moving forward.

If easements and the areas could not be cleared, relocating sewer mains from in between properties to the street in front of the properties is another option. Relocation of these sewers to the street would require significant modifications to services leaving the homes to connect the properties to the new sewers in the streets. Given the flat area, the limited space between the homes and the minimal slopes, this may not be feasible. Further investigation beyond the scope of this study is needed to assess the viability of this option. Modifying the plumbing within the home to redirect the flow to the front of the house is also an option, but this too may be difficult given the significant modifications needed for interior plumbing and the age and potential condition of the homes and their foundations. Also, modifying the services from these homes may not be covered under funding options available.

A final option which may be fundable is the installation of grinder pumps and small force mains behind the homes. The force mains would run from the grinder pumps installed in the backyard and connect to new sewers in the street. This would eliminate the issue of slopes and spacing for the sewers. While this would resolve the issue of getting the flows to the sewers in the street and there could be funding available, future maintenance of the grinder pumps and force mains would need to be discussed since this most likely would be borne by the resident. Based on input from the City and concern over the additional maintenance requirements, this option is not recommended.

4. There are fourteen pipe segments in the neighborhood which are color coded as Red. This means the pipe segments are in extremely poor condition and require immediate attention since there are numerous defects that have been identified during CCTV inspection. See **Figure 3** with pipe segments highlighted in red. The improvements for these segments include replacement of the sewer piping and associated manholes in kind.

5. There are thirteen pipe segments in the neighborhood which are color coded as Orange. This means the pipe segments are in poor condition and have severe defects that will become color coded red within the foreseeable future. These segments also require immediate attention since there are numerous defects that have been identified during CCTV inspection. See **Figure 4** with pipe segments highlighted in orange. The improvements for these segments include replacement of the sewer piping and associated manholes in kind.

6. Replace and upsize the sewer piping from the intersection of Everett and Parsons to the headworks of the wastewater treatment facility to eliminate surcharging. A hydraulic analysis to

determine the size that would provide sufficient capacity to deliver flows from the areas south, east, and west of this neighborhood as well as the flows from within New City would be needed to define the correct size for the sewer that would convey flows to the head of the wastewater treatment facility.

7. For the 9 pipe segments color coded yellow, the pipes are in fair conditions with moderate defects that will need to be monitored over time. It is recommended these be CCTV inspected when these roads are being further evaluated or modified as part of the neighborhood improvements to determine if there has been further deterioration and if improvements or replacement is necessary.

8. For the 12 pipe segments color coded green, the pipes are in good condition with only minor defects that do not require any further action at this time. When these roads are being further evaluated or modified as part of the neighborhood improvements, CCTV inspections of these segments should occur to determine if there has been further deterioration and if improvements or replacement is necessary.

Potential Sequence for Replacing Sewers

A potential sequence for replacing the sewers in the neighborhood would have to be coordinated with the other utility work being completed so that there would not be a duplication of efforts and costs when completing the work.

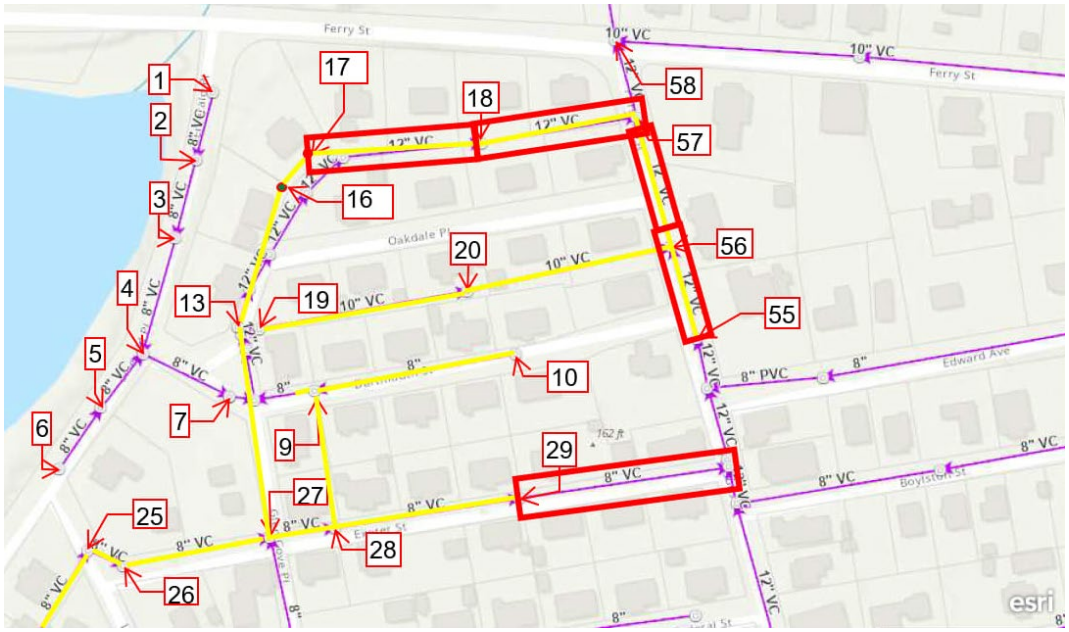
The most significant effort for the rehabilitation of the sewers is the upsizing and replacement of the transmission sewer from the intersection of Everett and Parsons all the way up to the head of the wastewater treatment plant (WWTP) at the intersection of Gosselin Drive and the Manhan Rail Trail. There is a restriction and backup in the existing sewers that need to be upgraded to assist with neighborhood sewer improvements.

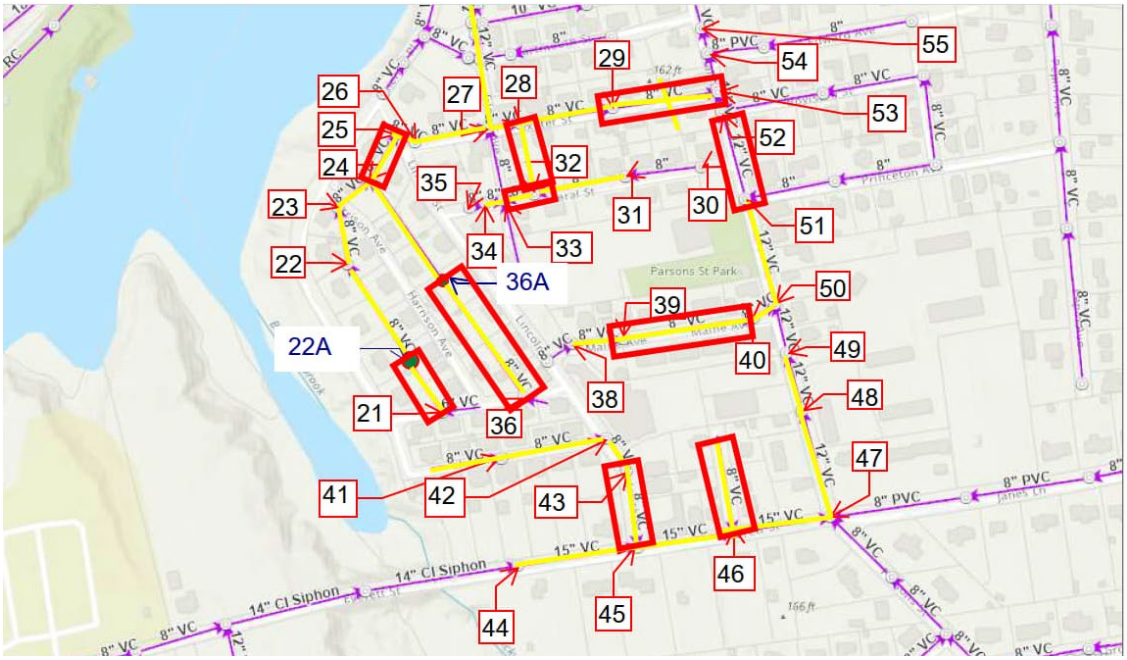
If this is one of the first sewers to be completed, the sequence for the water main improvements will need to be modified to include this street first in the improvements to the water main. The only caveat here is there are minimal valves that are available and could be used to isolate portions of the neighborhood and minimize the number of residents that would be without water. Further investigation would be needed to figure out the best way to complete the modifications on Parson Street in relation to the water if the Sewers on Parsons were addressed first.

The other main improvement necessary is the removal or replacement of the rear yard sewers in three locations and the installation of new sewers. This would require new sewers and the replacement of services for the homes. It can be done in the easement area or using grinder pumps and force mains to get the sewerage from the residents to the sewers in the street on Dartmouth, Oakdale, Harrison Lincoln, and Emerald Place.

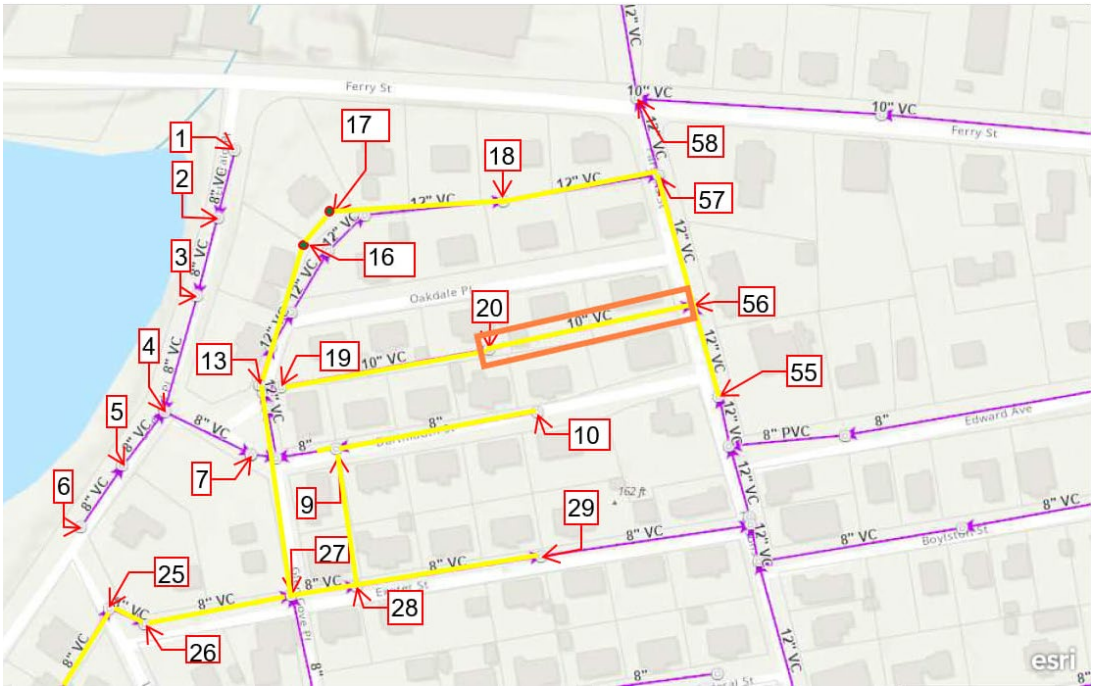
The other sewers to be replaced are based on the PACP ratings and the color coding provided in the summary table above. These can be replaced in conjunction with the other utilities scheduled to be replaced including the water and the storm drainage.

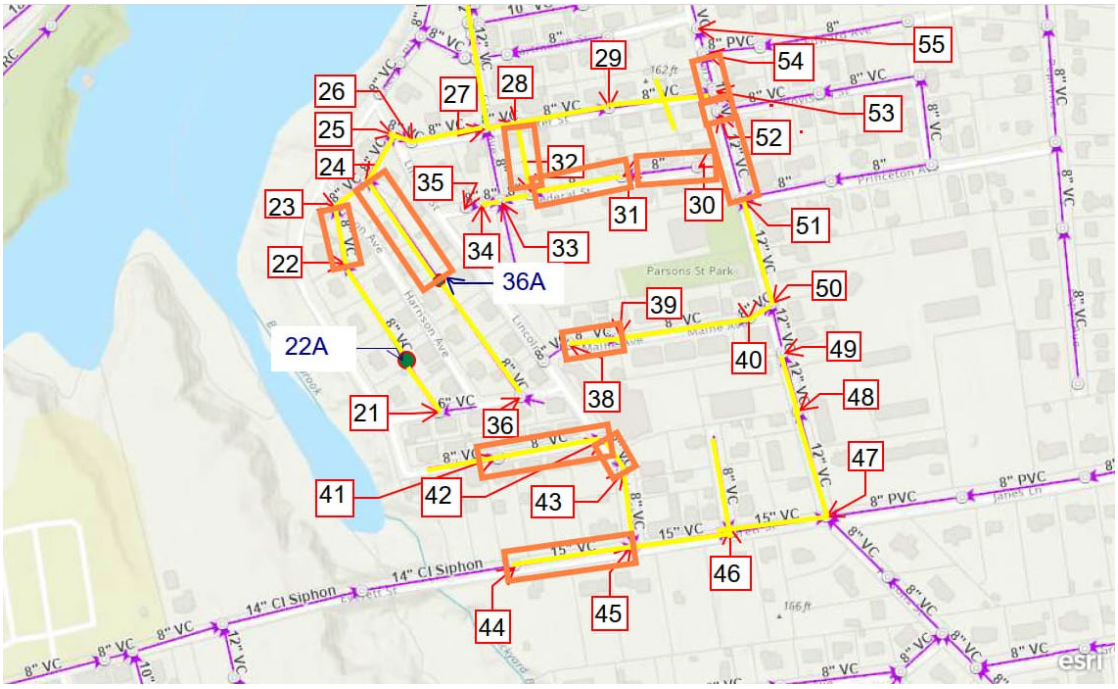
Sewer Segments Color Coded Red - Require Immmediate Attention





Sewer Segments Color Coded Orange - Severe Defects that will Require Immediate Attention





Appendix G

Detailed Cost Estimates (Order of Magnitude)

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Clinton Street**

SHEET:	1 OF 1
DATE PREPARED:	06/22/22
ESTIMATOR:	WTD
CHECKED BY:	KMF
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	500	$150.00	$75,000
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	16.00	$863.00	$13,808
30-inch Manhole Standard Frame and Cover	EA	2	$1,180.00	$2,360
4-foot DIA Concrete Manhole Invert	EA	2	$836.00	$1,672
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	475	$335.00	$159,125
8-inch DI Gate Valve	EA	1	$1,900.00	$1,900
18' Roadway	LF	465.0	$1,000.00	$465,000
12' Roadway	LF	675.0	$675.00	$455,625
Concrete Walk	SF	4,439.2	$10.00	$44,392
Granite Curbing	LF	671.2	$65.00	$43,631
On-Street Bioretention	SF	1,065.2	$110.00	$117,173
Demo-Mill	SY	1,450.0	$5.00	$7,250
TOTAL CONSTRUCTION COST				$1,387,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$138,700
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$346,750
SUBTOTAL				**$1,872,450**
20% Contingency				$374,490
TOTAL				**$2,246,940**
TOTAL COST (-30% TO +50% ROUNDED)				**$1,320,000 TO $2,810,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Dartmouth Street**

SHEET:	1 OF 1
DATE PREPARED:	06/22/22
ESTIMATOR:	WTD
CHECKED BY:	KMF
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	330	$150.00	$49,500
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	16.00	$863.00	$13,808
30-inch Manhole Standard Frame and Cover	EA	2	$1,180.00	$2,360
4-foot DIA Concrete Manhole Invert	EA	2	$836.00	$1,672
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	540	$335.00	$180,900
8-inch DI Gate Valve	EA	3	$1,900.00	$5,700
20' Roadway	LF	530	$1,100.00	$583,000
Tree box filter	EA	16	$15,000.00	$240,000
Granite Curbing	LF	811	$65.00	$52,691
Concrete Walk	SF	5,046	$10.00	$50,463
Demo-Mill	SY	1,203	$5.00	$6,015
TOTAL CONSTRUCTION COST				$1,187,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$118,700
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$296,750
SUBTOTAL				**$1,602,450**
20% Contingency				$320,490
TOTAL				**$1,922,940**
TOTAL COST (-30% TO +50% ROUNDED)				**$1,130,000 TO $2,410,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST		SHEET: 1 OF 1
PROJECT: New City Planning Study	FUSS & O'NEILL	DATE PREPARED: 06/22/22
LOCATION: Easthampton, MA		ESTIMATOR: WTD
DESCRIPTION: **Emerald Place**		CHECKED BY: KMF
		PROJECT NO.: 20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	512	$150.00	$76,800
8-inch PVC Sanitary Sewer Pipe	LF	795	$150.00	$119,250
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	56	$863.00	$48,328
30-inch Manhole Standard Frame and Cover	EA	7	$1,180.00	$8,260
4-foot DIA Concrete Manhole Invert	EA	7	$836.00	$5,852
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	1,648	$335.00	$552,080
8-inch DI Gate Valve	EA	11	$1,900.00	$20,900
22' Roadway	LF	600	$1,225.00	$735,000
18' Roadway	LF	1,000	$1,000.00	$1,000,000
12' Roadway	LF	300	$675.00	$202,500
Concrete Walk	SF	13,829	$10.00	$138,287
Granite Curbing	LF	2,575	$65.00	$167,375
Rain Garden	SF	4,673	$8.00	$37,382
onstreet bioretention	SF	3,772	$110.00	$414,913
Demo-Milling	SY	4,400	$5.00	$22,000
Utility Poles Relocation	EA	2	$5,000.00	$10,000
Retaining Wall	SF	819	$65.00	$53,235
Slope Stablization Measures	LS	1	$250,000.00	$250,000
TOTAL CONSTRUCTION COST				$3,863,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$386,300
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$965,750
SUBTOTAL				**$5,215,050**
20% Contingency				$1,043,010
TOTAL				**$6,258,060**
TOTAL COST (-30% TO +50% ROUNDED)				**$3,660,000 TO $7,830,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Everett Street**

SHEET:	**1 OF 1**
DATE PREPARED:	06/22/22
ESTIMATOR:	WTD
CHECKED BY:	KMF
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	780	$150.00	$117,000
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	32	$863.00	$27,616
30-inch Manhole Standard Frame and Cover	EA	4	$1,180.00	$4,720
4-foot DIA Concrete Manhole Invert	EA	4	$836.00	$3,344
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	1,105	$335.00	$370,175
8-inch DI Gate Valve	EA	5	$1,900.00	$9,500
TOTAL CONSTRUCTION COST				$533,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$53,300
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$133,250
SUBTOTAL				**$719,550**
20% Contingency				$143,910
TOTAL				**$863,460**
TOTAL COST (-30% TO +50% ROUNDED)				**$510,000 TO $1,080,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Exeter Street**

SHEET:	**1 OF 1**
DATE PREPARED:	06/22/22
ESTIMATOR:	WTD
CHECKED BY:	KMF
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	1,550	$150.00	$232,500
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	32	$863.00	$27,616
30-inch Manhole Standard Frame and Cover	EA	4	$1,180.00	$4,720
4-foot DIA Concrete Manhole Invert	EA	4	$836.00	$3,344
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	780	$335.00	$261,300
8-inch DI Gate Valve	EA	4	$1,900.00	$7,600
20' roadway	LF	770	$1,100.00	$847,000
Tree box filter	EA	30	$15,000.00	$450,000
Granite Curbing	LF	1,154	$65.00	$75,028
Concrete Walk	SF	7,362	$10.00	$73,615
Demo-Milling	SY	2,100	$5.00	$10,500
TOTAL CONSTRUCTION COST				$1,994,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$199,400
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$498,500
SUBTOTAL				**$2,691,900**
20% Contingency				$538,380
TOTAL				**$3,230,280**
TOTAL COST (-30% TO +50% ROUNDED)				**$1,890,000 TO $4,040,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST		SHEET: 1 OF 1
PROJECT: New City Planning Study	FUSS & O'NEILL	DATE PREPARED: 06/22/22
LOCATION: Easthampton, MA		ESTIMATOR: WTD
DESCRIPTION: **Federal Street**		CHECKED BY: KMF
		PROJECT NO.: 20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	580	$150.00	$87,000
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	48	$863.00	$41,424
30-inch Manhole Standard Frame and Cover	EA	6	$1,180.00	$7,080
4-foot DIA Concrete Manhole Invert	EA	6	$836.00	$5,016
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	726	$335.00	$243,210
8-inch DI Gate Valve	EA	4	$1,900.00	$7,600
20' Roadway	LF	720	$1,100.00	$792,000
Tree box filter	EA	28	$15,000.00	$420,000
Granite Curbing	LF	1,016	$65.00	$66,064
Concrete Walk	SF	6,161	$10.00	$61,614
On-Street Bioretention	SF	189	$110.00	$20,742
Demo-Milling	SY	1,600	$5.00	$8,000
TOTAL CONSTRUCTION COST				$1,760,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$176,000
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$440,000
SUBTOTAL				**$2,376,000**
20% Contingency				$475,200
TOTAL				**$2,851,200**
TOTAL COST (-30% TO +50% ROUNDED)				**$1,670,000 TO $3,570,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Ferry Street**

SHEET:	**1 OF 1**
DATE PREPARED:	06/22/22
ESTIMATOR:	WTD
CHECKED BY:	KMF
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Water Main				
12-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	550	$375.00	$206,250
12-inch DI Gate Valve	EA	4	$4,900.00	$19,600
Pedestrian Bridge	EA	1	$300,000.00	$300,000
24' Roadway	LF	200	$1,350.00	$270,000
Raised Street Xing-with flashing beacon	EA	1	$20,000.00	$20,000
8' Wide Pedestrian Bridge	EA	1	$350,000.00	$350,000
Conc Plaza / Walk	SF	996	$12.00	$11,952
Guardrail	LF	50	$80.00	$4,000
Signage	EA	1	$5,000.00	$5,000
Benches	EA	2	$1,500.00	$3,000
Plantings	SF	350	$9.00	$3,150
Granite Curbing	LF	160	$65.00	$10,400
Demo-Milling	SY	555	$5.00	$2,775
TOTAL CONSTRUCTION COST				$1,207,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$120,700
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$301,750
SUBTOTAL				**$1,629,450**
20% Contingency				$325,890
TOTAL				**$1,955,340**
TOTAL COST (-30% TO +50% ROUNDED)				**$1,150,000 TO $2,450,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST		SHEET: 1 OF 1
PROJECT: New City Planning Study	FUSS & O'NEILL	DATE PREPARED: 06/22/22
LOCATION: Easthampton, MA		ESTIMATOR: WTD
DESCRIPTION: **Glen Cove Place**		CHECKED BY: KMF
		PROJECT NO.: 20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	345	$150.00	$51,750
12-inch PVC Sanitary Sewer Pipe	LF	85	$225.00	$19,125
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	16	$863.00	$13,808
30-inch Manhole Standard Frame and Cover	EA	2	$1,180.00	$2,360
4-foot DIA Concrete Manhole Invert	EA	2	$836.00	$1,672
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	310	$335.00	$103,850
8-inch DI Gate Valve	EA	4	$1,900.00	$7,600
16' Roadway	LF	650	$725.00	$471,250
Concrete Walk	SF	1,101	$10.00	$11,015
Granite Curbing	LF	237	$65.00	$15,373
Rain Garden	SF	1,807	$8.00	$14,460
On-Street Bioretention	SF	764	$110.00	$84,041
Demo-Milling	SY	1,550	$5.00	$7,750
TOTAL CONSTRUCTION COST				$805,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$80,500
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$201,250
SUBTOTAL				**$1,086,750**
20% Contingency				$217,350
TOTAL				**$1,304,100**
TOTAL COST (-30% TO +50% ROUNDED)				**$770,000 TO $1,640,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Harrison Avenue**

SHEET:	**1 OF 1**
DATE PREPARED:	06/22/22
ESTIMATOR:	WTD
CHECKED BY:	KMF
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	685	$150.00	$102,750
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	8	$863.00	$6,904
30-inch Manhole Standard Frame and Cover	EA	1	$1,180.00	$1,180
4-foot DIA Concrete Manhole Invert	EA	1	$836.00	$836
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	675	$335.00	$226,125
8-inch DI Gate Valve	EA	2	$1,900.00	$3,800
20' Roadway	LF	650	$1,100.00	$715,000
Concrete Walk	SF	5,639	$10.00	$56,393
Granite Curbing	LF	954	$65.00	$62,007
Tree Box Filter	EA	14	$15,000.00	$210,000
Demo-Milling	SY	1,555	$5.00	$7,775
TOTAL CONSTRUCTION COST				$1,393,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$139,300
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$348,250
SUBTOTAL				**$1,880,550**
20% Contingency				$376,110
TOTAL				**$2,256,660**
TOTAL COST (-30% TO +50% ROUNDED)				**$1,320,000 TO $2,830,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Lewandowski Avenue**

SHEET:	**1 OF 1**
DATE PREPARED:	06/22/22
ESTIMATOR:	WTD
CHECKED BY:	KMF
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	262	$150.00	$39,300
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	16	$863.00	$13,808
30-inch Manhole Standard Frame and Cover	EA	2	$1,180.00	$2,360
4-foot DIA Concrete Manhole Invert	EA	2	$836.00	$1,672
Water Main				
6-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	265	$275.00	$72,875
6-inch DI Gate Valve	EA	4	$1,500.00	$6,000
				$0
				$0
On-Street Bioretention	SF	925	$110.00	$101,750
Granite Curb	LF	150	$65.00	$9,750
22' Roadway	LF	265	$1,225.00	$324,625
Milling	SF	6,200	$5.00	$31,000
				$0
				$0
				$0
				$0
				$0
TOTAL CONSTRUCTION COST				$604,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$60,400
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$151,000
SUBTOTAL				**$815,400**
20% Contingency				$163,080
TOTAL				**$978,480**
TOTAL COST (-30% TO +50% ROUNDED)				**$580,000 TO $1,230,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST		SHEET: 1 OF 1
PROJECT: New City Planning Study	FUSS & O'NEILL	DATE PREPARED: 06/22/22
LOCATION: Easthampton, MA		ESTIMATOR: WTD
DESCRIPTION: **Lincoln Street**		CHECKED BY: KMF
		PROJECT NO.: 20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	300	$150.00	$45,000
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	40	$863.00	$34,520
30-inch Manhole Standard Frame and Cover	EA	5	$1,180.00	$5,900
4-foot DIA Concrete Manhole Invert	EA	5	$836.00	$4,180
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	1,260	$335.00	$422,100
8-inch DI Gate Valve	EA	12	$1,900.00	$22,800
				$0
20' Roadway	LF	1,260	$1,100.00	$1,386,000
Multi-Use Walk	SF	10,595	$10.00	$105,954
Granite Curbing	LF	1,535	$65.00	$99,775
On-Street Bioretention	SF	3,620	$110.00	$398,200
Rain Garden	SF	2,819	$8.00	$22,550
Trees	EA	15	$1,500.00	$22,500
Demo-Milling	SY	4,500	$5.00	$22,500
Utility Poles?	EA	4	$5,000.00	$20,000
Treebox filters	EA	3	$15,000.00	$45,000
Conc. Walk	SF	5,800	$10.00	$58,000
				$0
TOTAL CONSTRUCTION COST				$2,715,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$271,500
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$678,750
SUBTOTAL				**$3,665,250**
20% Contingency				$733,050
TOTAL				**$4,398,300**
TOTAL COST (-30% TO +50% ROUNDED)				**$2,570,000 TO $5,500,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST		SHEET: 1 OF 1
PROJECT: New City Planning Study	FUSS & O'NEILL	DATE PREPARED: 06/22/22
LOCATION: Easthampton, MA		ESTIMATOR: WTD
DESCRIPTION: **Maine Avenue**		CHECKED BY: KMF
		PROJECT NO.: 20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
8-inch PVC Sanitary Sewer Pipe	LF	580	$150.00	$87,000
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	28.00	$863.00	$24,164
30-inch Manhole Standard Frame and Cover	EA	3	$1,180.00	$3,540
4-foot DIA Concrete Manhole Invert	EA	3	$836.00	$2,508
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	600	$335.00	$201,000
8-inch DI Gate Valve	EA	4	$1,900.00	$7,600
				$0
24' roadway	LF	565	$1,350.00	$762,750
Concrete Walk	SF	2621.2	$10.00	$26,212
Granite Curbing	LF	660	$65.00	$42,900
On-Street Bioretention	SF	1475	$110.00	$162,250
Demo-Milling	SY	1500	$5.00	$7,500
TOTAL CONSTRUCTION COST				$1,328,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$132,800
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$332,000
SUBTOTAL				**$1,792,800**
20% Contingency				$358,560
TOTAL				**$2,151,360**
TOTAL COST (-30% TO +50% ROUNDED)				**$1,260,000 TO $2,690,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Oakdale Place**

SHEET:	**1 OF 1**
DATE PREPARED:	06/22/22
ESTIMATOR:	WTD
CHECKED BY:	KMF
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
10-inch PVC Sanitary Sewer Pipe	LF	545	$480.00	$261,600
12-inch PVC Sanitary Sewer Pipe	LF	640	$510.00	$326,400
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	24	$863.00	$20,712
30-inch Manhole Standard Frame and Cover	EA	3	$1,180.00	$3,540
4-foot DIA Concrete Manhole Invert	EA	3	$836.00	$2,508
Water Main				
8-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	480	$335.00	$160,800
8-inch DI Gate Valve	EA	3	$1,900.00	$5,700
				$0
12' Wide Roadway	LF	480	$675.00	$324,000
22' Wide Roadway	LF	575	$1,225.00	$704,375
Granite Curbing	LF	915	$65.00	$59,475
On-Street Bioretention	SF	2,215	$110.00	$243,630
Concrete Walk	SF	4,413	$10.00	$44,132
Rain Garden	SF	701	$8.00	$5,611
Demo-Milling	SY	2,100	$5.00	$10,500
TOTAL CONSTRUCTION COST				$2,173,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$217,300
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$543,250
SUBTOTAL				**$2,933,550**
20% Contingency				$586,710
TOTAL				**$3,520,260**
TOTAL COST (-30% TO +50% ROUNDED)				**$2,060,000 TO $4,410,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST		SHEET: 1 OF 1
PROJECT: New City Planning Study	FUSS & O'NEILL	DATE PREPARED: 06/22/22
LOCATION: Easthampton, MA		ESTIMATOR: WTD
DESCRIPTION: **Parsons Street**		CHECKED BY: KMF
		PROJECT NO.: 20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Sanitary Sewer Pipe				
24-inch PVC Sanitary Sewer Pipe	LF	1,800	$500.00	$900,000
Sanitary Sewer Manhole				
4-foot DIA Concrete Manhole Sanitary Sewer	VF	120	$863.00	$103,560
30-inch Manhole Standard Frame and Cover	EA	15	$1,180.00	$17,700
4-foot DIA Concrete Manhole Invert	EA	15	$836.00	$12,540
Water Main				
12-inch DI Water Main; excavation, fittings, tees, taps, hydrants, asbestos pipe disposal	LF	550	$375.00	$206,250
12-inch DI Gate Valve	EA	3	$4,900.00	$14,700
				$0
22' Roadway	LF	1,580	$1,225.00	$1,935,500
On-Street Bioretention	SF	4,777	$110.00	$525,495
Demo-Milling	SY	3,862	$5.00	$19,310
Granite Curb	LF	1,735	$65.00	$112,775
Conc. Sidewalks	SF	14,855	$10.00	$148,550
TOTAL CONSTRUCTION COST				$3,997,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$399,700
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$999,250
SUBTOTAL				**$5,395,950**
20% Contingency				$1,079,190
TOTAL				**$6,475,140**
TOTAL COST (-30% TO +50% ROUNDED)				**$3,780,000 TO $8,100,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Parsons Street Park**

SHEET:	**1 OF 1**
DATE PREPARED:	06/22/22
ESTIMATOR:	JA
CHECKED BY:	
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Site Prep	LS	1	$10,000.00	$10,000
Demolition	LS	1	$15,000.00	$15,000
Erosion & Sediment Control	LS	1	$10,000.00	$10,000
				$0
Earthwork	SF	6,000	$0.35	$2,100
				$0
Concrete Sidewalks	SF	1,150	$10.00	$11,500
Concrete Pavers	SF	700	$25.00	$17,500
Site Bench	EA	5	$2,000.00	$10,000
Shade Structure	EA	1	$10,000.00	$10,000
Covered Seating	EA	1	$5,000.00	$5,000
Signage	EA	1	$5,000.00	$5,000
Misc Games	EA	1	$19,000.00	$19,000
				$0
Beehive Grate	EA	2	$1,000.00	$2,000
Drainage Pipe	LF	60	$75.00	$4,500
				$0
Rain Garden	SF	415	$7.00	$2,905
Wildflower Seeding	SF	300	$1.00	$300
Trees	EA	14	$1,800.00	$25,200
Lawn	SF	3,000	$1.50	$4,500
Privacy Fence	LF	70	$50.00	$3,500
Site Lighting	EA	3	$3,500.00	$10,500
Electrical Conduit	LF	150	$20.00	$3,000
Electrical Handholes	LS	3	$400.00	$1,200
Electrical Cabinet	LS	1	$7,500.00	$7,500
TOTAL CONSTRUCTION COST				$181,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$18,100
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$45,250
SUBTOTAL				**$244,350**
20% Contingency				$48,870
TOTAL				**$293,220**
TOTAL COST (-30% TO +50% ROUNDED)				**$180,000 TO $370,000**

Notes:

ORDER OF MAGNITUDE OPINION OF COST

FUSS & O'NEILL

PROJECT:	New City Planning Study
LOCATION:	Easthampton, MA
DESCRIPTION:	**Lincoln Street Park**

SHEET:	1 OF 1
DATE PREPARED:	06/22/22
ESTIMATOR:	JA
CHECKED BY:	
PROJECT NO.:	20170289.D10

Since Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions, Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

ITEM DESCRIPTION	UNITS	NUM. OF UNITS	COST PER UNIT	TOTAL COST
Site Prep	LS	1	$30,000.00	$30,000
Demolition	LS	1	$20,000.00	$20,000
Erosion & Sediment Control	LS	1	$10,000.00	$10,000
Import Material	CY	1,500	$25.00	$37,500
Earthwork	SF	40,000	$0.35	$14,000
				$0
Bituminous Parking Area	CY	245	$110.00	$26,950
Gravel	CY	166	$45.00	$7,470
Stepping Stone walk	LF	100	$30.00	$3,000
Bituminous Walk	CY	81	$110.00	$8,910
Security Gate	LS	1	$3,000.00	$3,000
Concrete Sidewalks	SF	4,725	$10.00	$47,250
Concrete Pavers	SF	600	$25.00	$15,000
Site Bench	EA	8	$2,000.00	$16,000
Shade Structure	EA	2	$10,000.00	$20,000
Bball Court AND hoop	EA	1	$25,000.00	$25,000
Signage	EA	1	$7,500.00	$7,500
Tables	EA	3	$3,000.00	$9,000
Site Lighting	EA	8	$3,500.00	$28,000
Electrical Conduit	LF	850	$20.00	$17,000
Electrical Handholes	LS	8	$400.00	$3,200
Electrical Cabinet	LS	1	$7,500.00	$7,500
Beehive Grate	EA	3	$1,000.00	$3,000
Drainage Pipe	LF	400	$75.00	$30,000
				$0
Rain Garden	SF	3,000	$7.00	$21,000
Wildflower Seeding	SF	1,450	$1.00	$1,450
Trees	EA	20	$1,800.00	$36,000
Lawn	SF	10,000	$1.50	$15,000
Privacy Fence	LF	330	$50.00	$16,500
				$0
Community Garden	LS	1	$36,000.00	$36,000
Fencing	LF	320	$35.00	$11,200
Garden Shed	LS	1	$5,000.00	$5,000
Water	LF	200	$115.00	$23,000
Meter Pit and Backflow Preventer	LS	1	$10,000.00	$10,000
Playground	LS	1	$150,000.00	$150,000
TOTAL CONSTRUCTION COST				$715,000
GENERAL REQUIREMENTS MOBILIZATION (10%)				$71,500
ENGINEERING/LEGAL/ADMINISTRATIVE (25%)				$178,750
SUBTOTAL				**$965,250**
20% Contingency				$193,050
TOTAL				**$1,158,300**
TOTAL COST (-30% TO +50% ROUNDED)				**$820,000 TO $1,740,000**

Notes: